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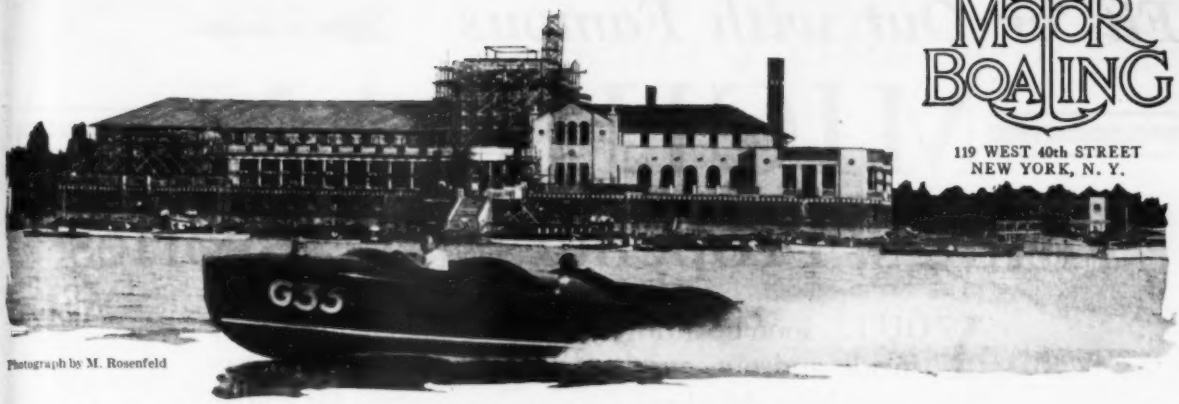

Photograph by M. Rosenfeld

One of the Gold Cup Racers passing the new home now under construction for the Detroit Yacht Club

AMERICA, as represented by the Yachtsmen's Association of America, and which will put on the 150-mile motor boat race at Detroit for $25,000 next Labor Day, has been recognized internationally. The conference of European motor boat enthusiasts at Brussels on Oct. 2, resulted in the formation of the International Motor Yachting Union, and the Y. A. A., has been accorded a seat in the council of the new organization.

The International Motor Yachting Union will function in place of the former Association Internationale du Yachting Automobile, which passed out as a result of the Great War. The new body has been fathered by Commodore R. Morton Smart, of the British Motor Boat Club. The conference in the Belgian city was attended by 40 delegates representing 10 countries in Europe. The Y. A. A. was invited to send a delegate but this was not thought feasible by its president, Commodore Garfield A. Wood and other officials. A representative of the English sportsmen interested in motor boat racing for international trophies, was to have visited Detroit during the recent Gold Cup regatta to discuss the matter, but failed to fill his engagement.

After the Gold Cup regatta Secretary J. Lee Barrett, of the Y. A. A., wrote to Commodore Smart at length regarding the matter and has received the following cablegam: "International Motor Yachting Union formed, Unanimous vote 40 delegates 10 countries. Greets Yachting Association America, seat of council reserved for her. (Signed) Morton Smart. Further advices by mail are expected by Secretary Barrett, giving the decisions on class racing and other problems entering into the project to stimulate international competition.

Encouragement offered by the new organizations on both sides of the Atlantic is expected to increase the number of racing boats in 1923.

Officials of the Y. A. A. are confident that the $25,000 purse for the 150-mile International Motor Boat Sweepstakes, next Labor Day, will bring over a number of foreign entries, due to the limitation of engine sizes to a maximum of 1350 cubic inches piston displacement.

The division of the $25,000 prize fund for the race, as announced by Commodore Fred R. Still, chairman of the Y. A. A. race committee, follows:— $10,000, $5,000, $3,000, $2,000, $1,500, $1,000, $700, $500, $300, $200. These prizes will be paid to the 10 boats finishing the race in order, making a total of $24,200. The remaining $800 will be divided into two prizes. The leading boat at 51 miles will give its owner a prize of $300 and the leading craft at 99 miles will earn its skipper $500. These prizes are put up to keep up the interest of the contestants and the speed of the race.

The race committee at a recent session voted to conduct the event on a three-mile course.

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MoToR BoatinG is published monthly by the International Magazine Company, William Randolph Hearst, president; C. H. Hathaway, vice-president; Ray Long, vice-president; Joseph A. Moore, treasurer; W. G. Langdon secretary; 119 West 40th Street, New York, N. Y., U. S. A. Single Copies, 25 cents. Yearly subscription in United States and Canada, $3.00. In foreign countries, $4.00. When you receive notice that your subscription has expired it is best to renew it at once, using the blank enclosed. When requesting a change of mailing address, give the old as well as the new one. Allow four weeks for the first copy to reach the new address. Copyright, 1922. International Magazine Company (MoToR BoatinG).

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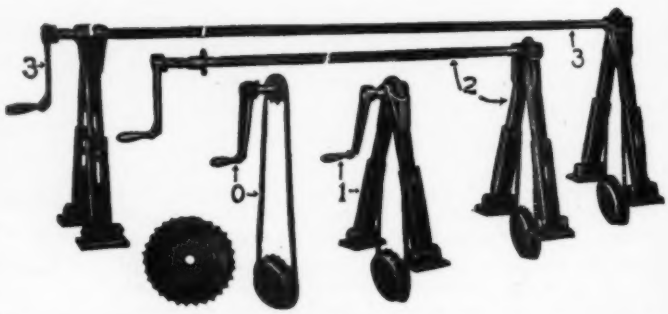

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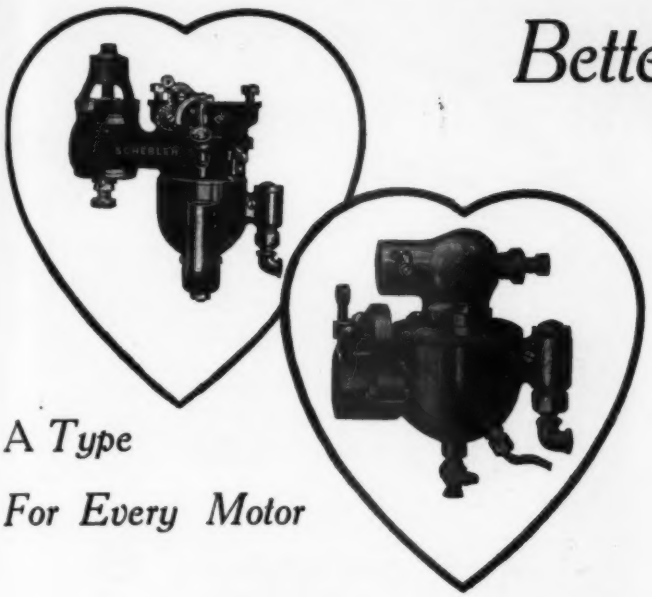

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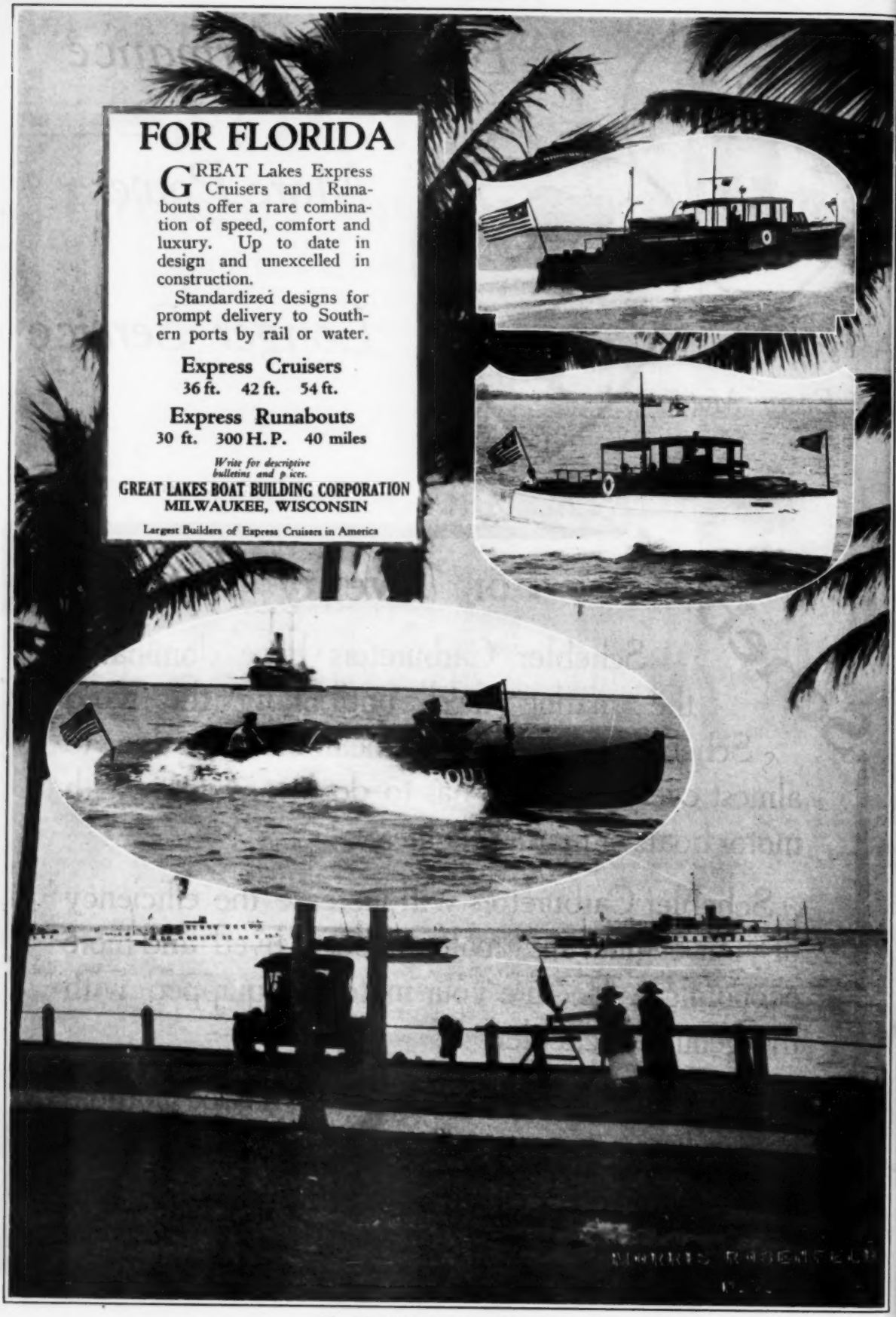

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The way they raced at Buffalo. Two of the 25-foot runabouts in the 625 cubic inch class, which ran almost side by side for 30 miles. This class has proven the sensation of the 1922 racing season and has lead to the development of an honest-to-goodness gentleman's runabout, powered with a real marine engine. The speeds developed have been better than 40 m.p.h. and the motors are turning in some cases 2500 r. p. m., an engine speed almost unbelievable

Buffalo Breaks Runabout Racing Records

New Speeds Established In All Classes. Fifty-Three Miles An Hour In the 2,200 Cubic Inch Class and Forty-One Miles In the 625 Class

By Charles F. Chapman

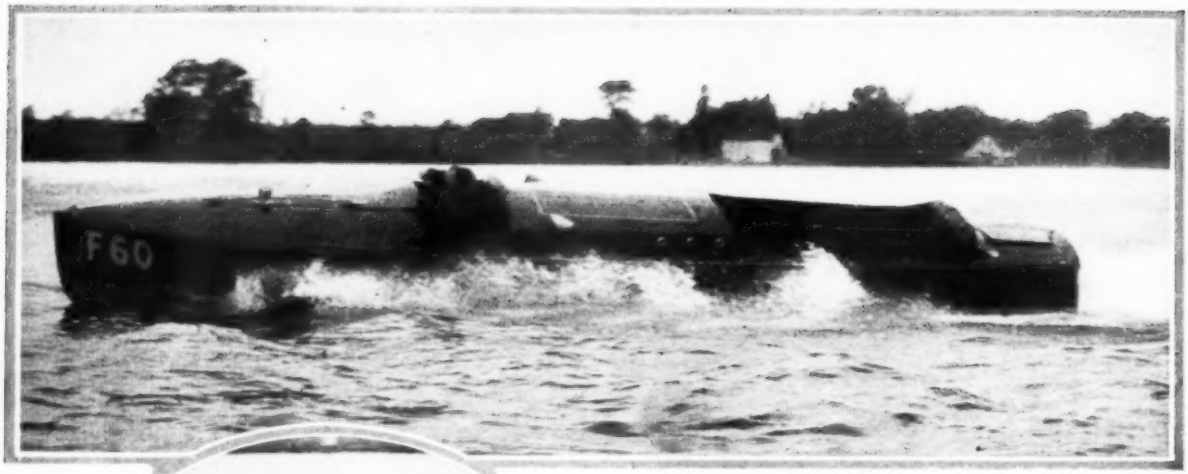
ALL scores were settled at Buffalo. Alibis hanging over from early race meets are no longer justified.

Buffalo always was noted for her ability to come back and this year proved no exception to the rule. After a glorious fizzle of the Buffalo regatta, scheduled for August, due largely to the Buffalo officials being away cruising and the racing men declining to be interested in a regatta of more or less local nature until the national classics were settled, Buffalo certainly did herself proud the latter part of September when racing men from the several racing sections on the Great Lakes got together for the final wind-up of the season. If it had not been for some of the failures and breakdowns in earlier regattas, this year's Buffalo events might not have taken place. However, the break-downs happened and the owners, believing that they had been the victims of ill luck, requested a return race of the victors and when the Buffalo Launch Club announced their postponed regatta would be held late in September on the Niagara River, it settled a time and place for those who had won earlier in the year and those who had not, to get together and settle all differences once for all.

The weather during the three days' racing at Buffalo might have been better overhead, but as far as water conditions were concerned, they could not have been improved upon had they been made to order. In past races, the Niagara River has been noted for its chop and its ability to make the going very uncomfortable for contestants. The effect of this year's weather was only felt by the crowds of spectators and many among them showed their interest in the water sports by remaining along the race course in the pouring rain of the first day.

While Buffalo this year had no Gold Cup or Fisher-Allison Trophy to offer for competition, yet a newly offered one, The Leary Trophy, was raced for for the first time and an older trophy, the International Trophy, turned over by the National Association of Engine and Boat Manufacturers to the American Power Boat Association was again put into competition and the first race held this year at Buffalo. Besides these two trophies, both of which were for hydroplanes, classes were arranged according to piston displacement of the motors, one for boats powered with motors of the 625 cubic inches piston displacement or less, another for the 1100 cubic inch class, and one for 2200 cubic inch motors, all runabout classes irrespective of the boats' length or other particulars.

The 2200 cubic inch class proved the greatest event from



Sayanora, owned by Harry T. Vars of Buffalo. This boat is a 35-footer powered with a 6-cylinder type G. R. Sterling motor. Sayanora ran in three 30 mile heats in the 1100 cubic inch class, and her running was so consistent that she varied hardly one second from one lap to another

Miss Peerless, powered with an 8-cylinder Peerless motor which won the Leary Trophy

every standpoint. The two principal contenders were Baby Gar II, owned by Gar Wood of Detroit which earlier in the year had won the third leg on the Wood-Fisher and Wood Fish, Edsel Ford's Hacker designed boat which proved very fast in the Wood-Fisher race of Detroit, but on account of accidents, did not get started in either the first or second heats of that race and broke down for several minutes in the third heat. However, the speed shown by Wood Fish while she did run at Detroit showed her to be very fast and therefore when it was announced, that these two boats would race against each other at Buffalo everyone was assured that a real contest—minus any hippodroming—was to take place. Several other craft also ran in the 2200 cubic inch class, some of them being smaller boats which had competed in smaller classes, and others which might be called alsorans, but none of which were in a class of Baby Gar II and Wood Fish. Both of these boats were powered with identically the same motor, namely: one 12-cylinder Liberty each and were of the same length, 32 feet and identical in beam measurement. The design of Baby Gar II was worked out by Jay Smith and the hull was constructed by the designer and his brother Bernard at their shops at Algonac, Michigan. Wood Fish was designed and built by the John L. Hacker Boat Company of Detroit.

The results at Buffalo in the 2200 class were not far different than in the Wood-Fisher races at Detroit in which the same two boats participated. Baby Gar II again demonstrated that she had the endurance qualities to bring her home the victor in the total race consisting of three heats of 30 miles each, although Wood Fish once again demonstrated that she was very fast and on the last day, with Paul Strasburg at the wheel outran Baby Gar II, taking first place in this heat, which, however, did not give her points enough to win the total race as Commodore Wood's boat had come home the victor in the first two heats due to mechanical trouble experienced in the motors of the Ford craft.

Nick Nack, owned by Commodore Humphrey Birge of Buffalo, making one of the single buoy turns. At speed, this craft, which is powered with a 6-cylinder Hall-Scott marine motor is out of water nearly one-half her length, but is the best turner of any boat this season

Baby Gar Jr., owned by Commodore Gar Wood of Detroit, winner of the 1100 cubic inch class and third in the 2200 inch class. This boat is a 26-footer, powered with 825 cubic inches. The best speed for a 5-mile lap being 43.8 m. p. h.

Arab VI, owned and driven by Commodore Ralph Sidway of Buffalo, this boat won the 625 cubic inch class. She is powered with a 6-cylinder Sterling Sea Gull motor.

New world's records were established in practically every class at Buffalo. The course was five miles to the lap with a single turning buoy at each end, and with the absence of wind, it made the Niagara River course a very fast one. Wood Fish established a new record for both the entire race of thirty miles and one lap of five miles, setting the former at 53.25 m. p. h. and the latter at 53.6 m. p. h. Baby Gar II also showed phenomenal speed as her best record for thirty-mile heat was at the rate of 50.8 m. p. h. and her best lap was done at a speed of 53.0 m. p. h.

In the 1100 cubic inch class for displacement boats, Baby Gar Jr. set up a thirty-mile record at 41.1 m.p.h. and a five-mile lap record of 42.3 m. p. h.

In the class for 625 cubic inch displacement boats, Arab VI, which just failed to win the Gold Cup at Detroit this year, showed a thirty-mile record at Buffalo of 39.1 m. p. h. and five-mile lap record of 41.9 m. p. h. A year ago, no one would have prophesied that it would be possible to get the speeds shown by Arab VI in a boat of her type with only 625 cubic inches. This record is even more wonderful when one considers the fact that the hull of Arab VI was not designed for her present power plant but for an aviation motor which is several hundred pounds lighter and not having the refinements of her present 200 h. p. Sterling Sea Gull, it made it necessary to construct the hull of Arab VI much stronger and heavier than would have been required had it been designed originally for her present motor.

Another record fell in the 220 cubic inch class of hydroplanes which was for the International Trophy. Baby Sure Cure, owned by Paul Strasburg, took the first heat, but Baby Holo, owned by Horace E. Dodge of Detroit, won in the second and third heats and thus took the trophy. Baby Holo's best thirty-mile speed was at the rate of 62.5 m.p.h.

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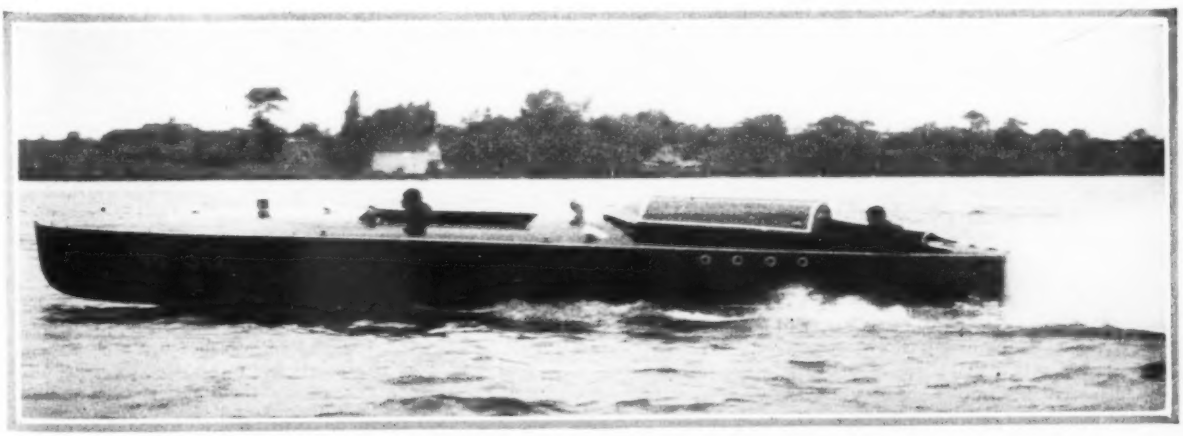
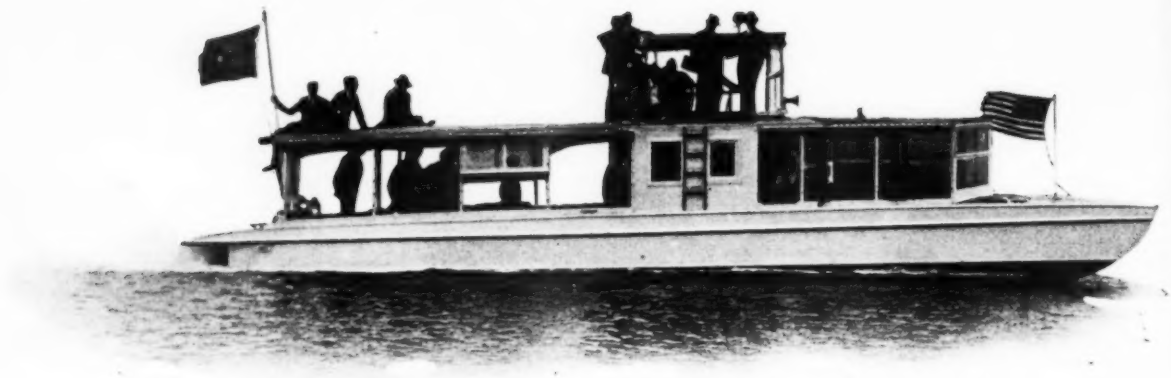


Wood Fish, owned by Edsel Ford of Detroit, and driven by Paul Strasburg. Wood Fish is a 32-footer, designed and built by Hacker. Her power is a 12-cylinder 1650 cubic inch motor. Her best speed for a 5-mile lap was 53.6 m. p. h.



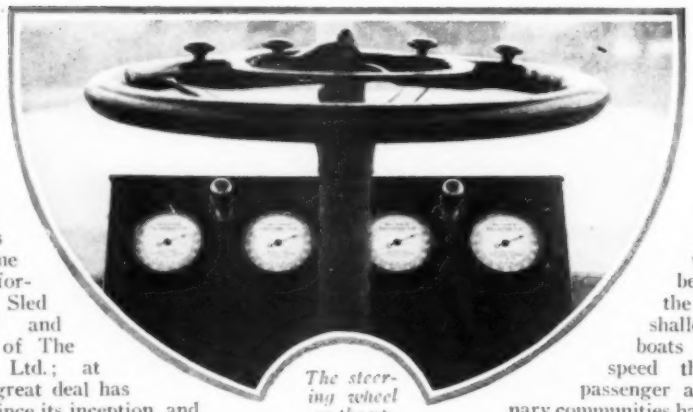
The American built Sea Sled Luz for South America underway

Sea Sleds Make Water Transportation Possible in South America

An Entirely New Field for American Motor Boats and Marine Engines Expected to Develop

By William E. Gibb

TO those who have been confronted with the problem of transporting any amount of weight at speed in boats, particularly in shallow waters, and who are familiar with the inefficiencies of the conventional type of boats in this work, will come as a revelation the performance of the new Sea Sled Luz, just completed and launched at the plant of The Sea Sled Company, Ltd.; at West Mystic, Conn. A great deal has been heard of this boat since its inception, and the performance of it on its official trials much more than justified the expectations of the designers and builders. An increase in useful load carrying of 100% showed a decrease in speed of only about 10%, and the boat under this abnormal overload is even far faster than her guaranteed speed.



The steering wheel on the upper deck where all the controls for the four engines terminate

This new remarkable craft opens a truly wonderful field of possibilities. Up to this time fast motor boats have been used largely for pleasure and very light transportation, but this new Sea Sled shows that it is possible to utilize the combination of high speed and great weight carrying ability, that is common to all boats of Sea Sled design, commercially for the transportation of passengers or cargo at speed in shallow waters. In numberless parts of the world there are countries where the nature of the terrain makes the building of roads and railways hard and impracticable, yet those same countries are traversed by rivers, that can now be thought of as highways upon which this new series of large Sea Sleds can be used as motor cars and trucks.

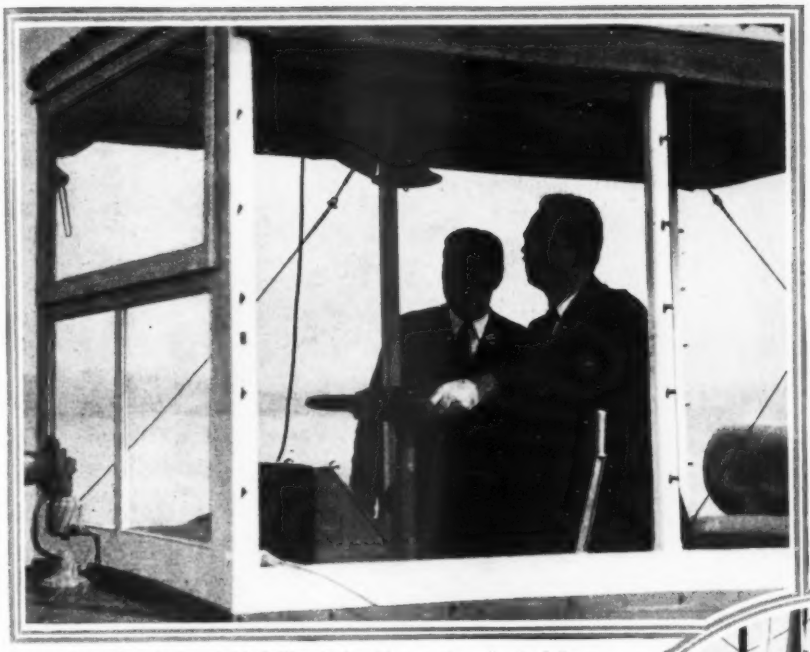
The history of the origin of this new model is interesting. Colombia, in South America, a country of great wealth. is populated by approximately six and a half millions of inhabitants, of which number about one and a half millions live on the seacoast and the remainder live inland several hundreds of miles. The great weaith of this country is located inland, where this wealth is represented in its agricultural possibilities, its mines, oil fields, etc.

Connecting the seacoast of this country with its inland towns there are no railways or passable roads, but there is the Magdalena River, a stream passing nearly across the entire width of the Country, a stream that is wide and in most points that is deep, yet in some places shallowing down to the depth of not more than three feet of water or less. The current of this river is quite rapid.

This Magdalena River has always been the highway through which passes all travel between the seacoast and the interior. Because of its shallow passages, the use of boats of ordinary type and speed that would be seen in passenger and freight work in ordinary communities has not been practicable. The present transportation is handled by a large fleet of stern wheel river steamers, similar to those used on our Mississippi Valley Rivers. The steam engines are wood burners and the boats, as is true of all of this type, are slow and difficult to maneuver. The passage from Barranquilla, the seaport town, inland to Girardot, the port of Bogota, a trip of approximately 560 miles, means a journey of from two to three weeks with lack of all conveniences. These river steamers have to stop, pick up their fuel on the banks, and as they have a maximum speed of only six to seven miles per hour, it can well be seen that their speed loaded going up the river is greatly reduced, explaining the length of time necessary for the journey. Coming down the river these same steamers encounter other obstacles, inasmuch as the common drawback of this type of difficulty of maneuvering makes it hard to keep them off the sand-banks and to keep them from striking floating and submerged obstructions.

A group of prominent Colombians headed by Senor Gonzalo Mejia of Medellin in that country, have been endeavoring for the last ten or twelve years to provide on the Magdalena River a system of transportation that would make the journey from Barranquilla to the inland towns comparable in time and convenience to the up-to-date transportation facilities existing in this country. In this endeavor they had developed for them the original gliding boats and ricochets, but this craft while fast cannot carry any amount of weight and, having no flexibility, had to run at full speed or not at all.

During the past Winter the Sea Sled Company, having been approached by Senor Mejia, offered to undertake the



Senor Gonzalo Mejia of Medellin, Colombia, at the wheel of Luz

solution of this problem, a solution that seemed to most people impossible. Although Sea Sleds, as they have been known for the past several years, have been in a class by themselves in their ability to carry weight at speed in shallow waters, still the requirements of this Colombian situation were so exacting and unusual that it necessitated the development of even a more remarkable type of Sea Sled than existed at that time. Albert Hickman, the originator of the Sea Sleds and President of the Company, entered into a series of experimenting as a result of which this latest series of Sea Sleds represented by this first boat, the Luz, was designed by both Mr. Hickman and George Crouch.

The boat itself is, as can be seen from the accompanying photographs, exceedingly well thought out for the work for which it is intended. It has moulded dimensions of 47 x 12 feet, its overall length being approximately 50 feet. The contract called for the accommodation of 20 passengers in a protected compartment forward, a compartment that not only would be protected from inclement weather, but that would moreover be light and airy in pleasant weather, it being remembered that the country in which the boat is to be operated has a very warm climate.

These 20 passengers are accommodated in the forward compartment, each passenger being comfortably seated in a wicker chair provided with cushions with spring upholstery. The forward end of the compartment is provided with glass windows, part of them being arranged as windshields, so they can be opened for ventilation. The sides of this compartment are equipped with curtains in case of rain.

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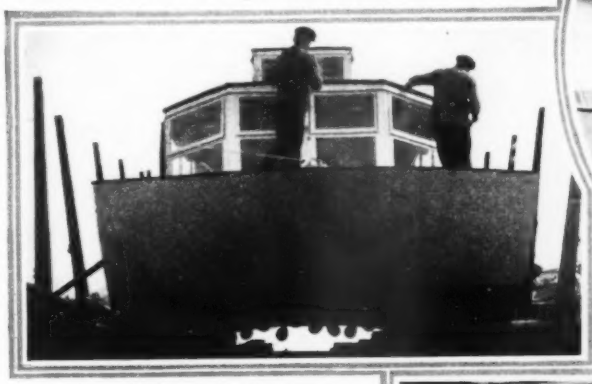
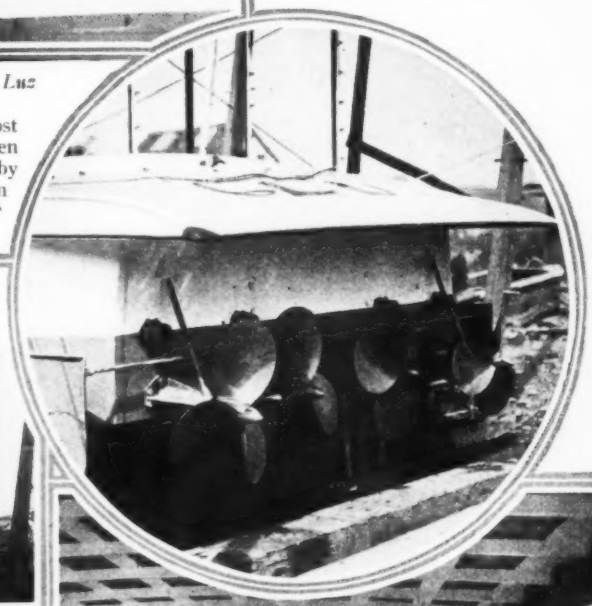
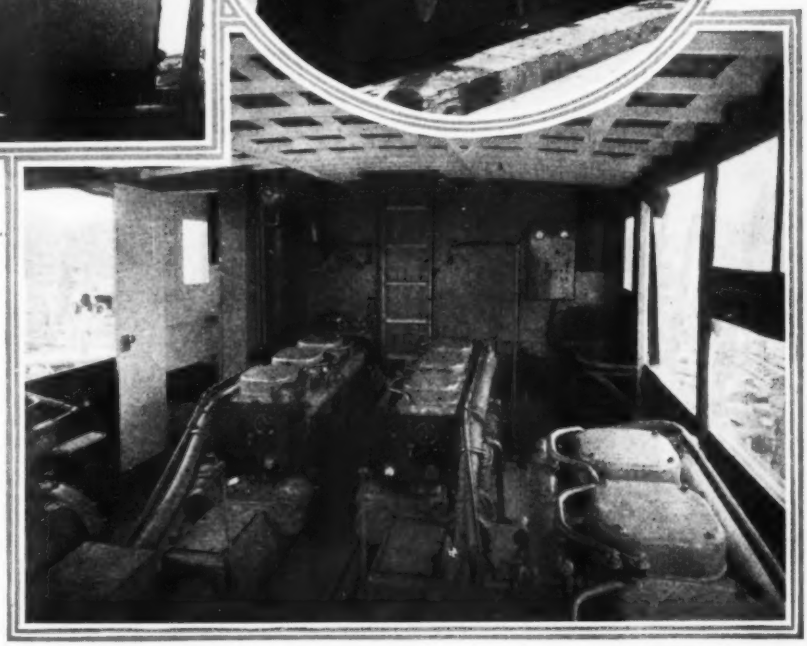
A stern view of the Sea Sled Luz, showing the four Hyde Surface propellers

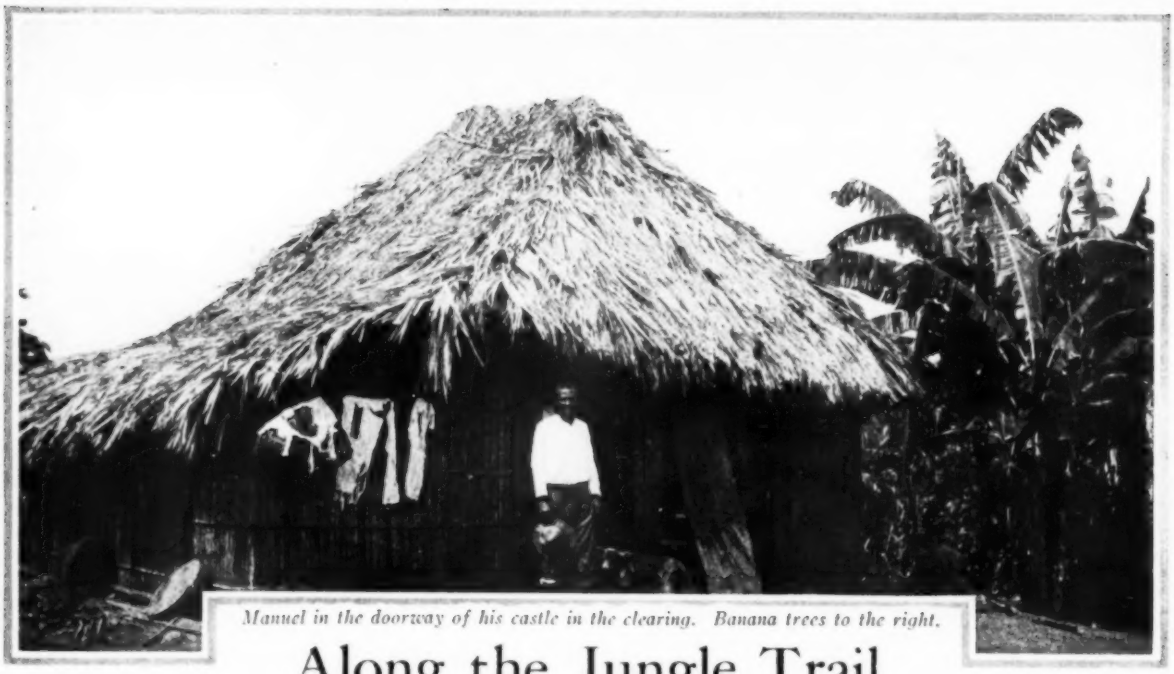


Bow view of Luz with the lower tips of the propeller at the stern showing under the hull. This gives one an idea of what a small portion of the propeller goes down below the boat's bottom





A glimpse of one corner of the engine room. Four 6-cylinder Sterling Dolphin engines form the power plant. The two center engines may be seen in the background and a part of the two wing engines in the foreground



Manuel in the doorway of his castle in the clearing. Banana trees to the right.

Along the Jungle Trail

The Crew of Hippocampus, Exploring in Panamanian Waters, Penetrate the Tropical Bush and Eat with the Natives—Further Adventures Afloat

By Alfred F. Loomis

Editor's Note. The 28-foot auxiliary Hippocampus is still far from home, finding her way into interesting places. Not the least of these are the beautiful Pearl Islands of Panama Bay, and in the last instalment Mr. Loomis told of his quest there for an ideal anchorage. After several days of fruitless search he and Mrs. Loomis came to a bay which they immediately named Comfort Harbor, and let go anchor in what they considered idyllic surroundings. But the story closed with the appearance of the English-speaking negro Manuel, who warned the Americans that the harbor was anything but comfortable, and advised them to leave before nightfall and certain disaster.

LOOKING back on him I believe that Manuel, the English-speaking native of Rey Island who came to our rescue in Comfort Harbor, was a perfect liar. Not a born liar, but one who had so schooled himself in the prevarication of two languages that you could not tell where truth began or untruth ended.

Coming alongside Hippocampus in his dugout canoe and putting a bundle of roots and rabbit meat aboard as if he knew he could make himself at home, he told us that the harbor was dangerous and that we were anchored in the very worst part of it. I had already remarked to Jo, my wife, and I then repeated to him that I thought the spot would be bad in a southerly gale, but that I didn't look for wind from that quarter.

"Yes," said Manuel, borrowing a line to secure his cayuca to our towing bitt, "bad tonight. *Mucho* Sea breaks *aqui*. Eight o'clock."

"But how about the native sloop we see anchored inshore of us?" I protested. If the sea breaks here it is going to break there too. *Malo* for sloop. Bad."

"Sea no break on sloop," said Manuel imperturbably. "Sloop leave after dark for other place. We go now Mafafa harbor. *Excelente*. Sandy bottom. No wind."

Now, I am well enough acquainted with the habits of these people who have a mixture of Spanish and negro blood in their veins to know that they are unlikely to spend the better

The town of San Miguel, "capital" of the Pearl Islands and principal headquarters of the pearl fishermen

All the natives of the Pearl Islands who went alongside Hippocamus thought she was a "too pretty" boat

part of an afternoon beating into a harbor—as the crew of the sloop had done—only to row out of it after dark. But I could not tell Manuel what I knew because he immediately developed an inability to understand any more English than he cared to understand. Neither could I fly in the face of Providence and disregard the advice of a native who seemed to have no other motive than kindliness in telling us to change our anchorage.

Consequently, Jo and I furled the awning, weighed anchor, and in ten minutes were under way for Mafafa. The sloop remained where she was, and, for all I know to the contrary, is still in Comfort Harbor—or to give it its rightful name which we learned from Manuel, Cacique.

The sun had sunk before the anchor was aweigh, and by the time we had motored the two or three miles to Mafafa it was too dark to see where we were going. But the negro was at the tiller, spitting to windward with the intensity of his pleasure and satisfaction, and when he gave the word to let go, the anchor went down in soft sand in four fathoms of water. If no better than our other anchorage—and we had already commenced to believe again that Cacique was perfect—Mafafa seemed good enough, and Manuel left us with the assurance that we would have a quiet night.

On the way over, this colored Samaritan had informed us that he happened to live in Mafafa—Jo and I exchanged glances at this—but that he had a clearing in the jungle at a place called Paraiso where he could show us immense water melons, yams, sweet corn and other fruits of the soil and of the sweat of his brow. If we cared to, he would take a day off and show us this very good farm that he had worked hard to make. So we, who had been anxious to obtain an inside veiw of the tropical jungle, but who hadn't much cared to hew a trail through the underbrush with machetes, accepted his offer.

On the following morning he came aboard at a quarter to seven. The hour of seven-fifteen had been set for his arrival and our departure, but Manuel's timepiece was the sun, and inaccuracies of half an hour are excusable early in the morning. When he had finished breakfast and shared coffee with our guide we proceeded to Cacique and came to anchor near the sloop. She had not stirred from her position, although Manuel, with a successful effort at keeping a straight face protested that she had left after dark and returned before daylight.

Loomis thought he was a mighty fisherman until he sampled the cooked meat of this twenty-pound jack

We now disembarked in his cayuca and our dinghy and landed on a sandy bar near the entrance to a tidal stream. Manuel, who had observed and admired my .22 rifle when on board the Hippo, carried it with him as a snake preventive. As he landed through the small surf he overturned the canoe and wet the rifle. Whereupon I took it from him and found myself armed with one Luger automatic pistol for big snakes, one rifle for little ones, and one camera for other game, all brought on the advice of Manuel. Only the camera came into play during the day and that not for hunting purposes, as the trail was well used by humanity and carefully avoided by other living things.

Our guide monarch of all the cleared jungle he surveyed, posed with machete in one hand and a melon in the other

Again Manuel's imagination had carried him to extremes.

Launching beyond the river bar and rowing up the estuary, we landed at a clearing in the mangroves, and here we left the boats and started afoot along a hard-packed trail about three feet wide and eight feet high. In places it was no more than a tunnel through the underbrush; but whether it led under the heavy branches of forest patriachs or through a partial clearing in which sugar cane and plantain grew, Manuel's machete swung around his head and about his knees, keeping the persistent vegetation from filling up the space which a man, with a pack on his back, requires for walking.

Busy though our guide was with his steel blade, Jo and I (and epecially I) had hard work keeping up with him, and, after half an hour of brisk walking, we were glad to rest by a spring and drink from a calabash. Then, agreeing with Manuel that it was hot even in the shade of the jungle, we pressed on, and by the end of an hour had reached a hut in a clearing. This, said the native was his home. Here, in three small rooms, he lived with his wife and two other couples. In Mafafa, he added, was his other home where he lived with his little boy, and in Mafafa also was his sweetheart.

The complicated nature of Manuel's domestic arrangements fairly took our breath away, and I erupted in a shower of questions. Did Manuel have two wives? No! One was enough for any man who had to work for his living. Why didn't his child live with its mother? Its mother was dead; this wife was a later one. Well then, having a wife and child, was it customary in the Pearl Islands to have a sweetheart too? No, Manuel explained, but this sweetheart was the school teacher at Mafafa and a very fine woman. He "luffed" her, and he worked hard to make a home for her.

San Miguel, as viewed from the cemetery

From this I gathered that he did not love Wife Number Two, and that as soon as he realized the profits of his jungle clearing he would summarily leave her and marry the school teacher. The point seemed such a delicate one that I asked no further questions.

The mystery with which our guide succeeded in shrouding himself was intensified when he explained his daily routine. To work in the bush at seven in the morning; lunch with his wife at noon; work until four, then by trail and canoe to Mafafa where he arrived after dark and spent the night. Back by cayuca and trail in the morning to work again among his yams at seven. Either Manuel was an unusually industrious man or an ingenious liar; but, making due allowance for possible errors in interpretation, Jo and I both inclined to our original belief that the truth was not in Manuel.

At any rate when Mrs. Manuel appeared on the scene, shortly after our arrival at the hut, she greeted her husband in a cool, not to say aloof, manner. She had a civil *Bueno dias* for us and a word or two to the women who were already in the hut, but for

(Continued on page 66)

This spare sail, spread to preserve it from mildew, gave San Miguel an extremely yachty appearance

At least the cemetery was well kept

VOL. 5 NO.

Nirvana

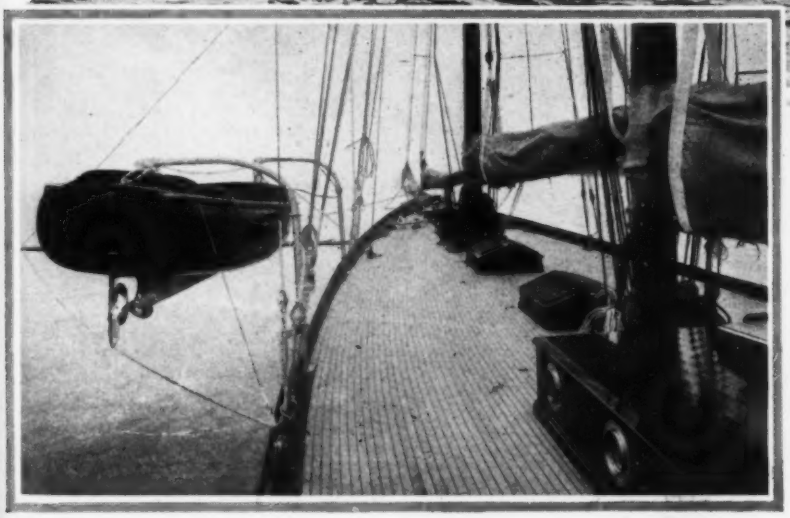
An Auxiliary Schooner of Pleasing Lines Which Will Appeal to All True Sailors

PROMINENT among the many new vessels launched during the summer is the auxiliary schooner Nirvana. This vessel was completed from designs by H. J. Gielow, Inc., and has an overall length of 68 feet 6 inches. Her waterline length is 48 feet 6 inches, while the beam and draft are 15 feet 8 inches and 9 feet 6 inches respectively. Nirvana is one of the most attractive auxiliaries of the smaller size which have been built in recent years. Her owner, H. Struckmann, a member of the Larchmont Yacht Club, is planning extensive cruises along the Atlantic Coast and including a visit to the West Indies during the next few months. The auxiliary power which has been provided for Nirvana is a four cylinder Standard gasoline engine of 6-inches bore and 8-inches stroke. This is installed in the after end of a saloon, and so arranged that it may be entirely closed in to provide a table top over the machine. It is practically hidden from view when enclosed and the arrangement is compact and convenient. The interior arrangement provides a main cabin forward as well as a large double stateroom aft.

Photographs by M. Rosenfeld

A single screw driven by a four cylinder Standard engine of 6 inch bore and 8 inch stroke and of 32-37 h. p. serves Nirvana when under power alone. This engine is sufficiently powerful to drive the boat at a comfortable speed.

Nirvana is 67 feet 6 inches over all length which is reduced on the waterline to 48 feet 6 inches. Her hull constructed entirely of wood is very sturdy and seaworthy. She is rigged as a schooner with an ample spread of canvas, and in a strong breeze can show her heels to many a motor boat of the 12 mile type



The broad expanse of clear deck space is a joy to behold. Necessity compels plenty of room for the handling of sails and it is only on boats of this type that such expansive spaces are possible. The interior arrangement locates all quarters below decks, leaving only some skylight or raised deck with ports for ventilation

Sayonara, a fast runabout designed by Geo. F. Crouch for the Fisher race and powered with a GRS 6-cylinder Sterling

Sayonara and Prohibition

Fast Runabouts Developed By the Fisher Trophy Race Conditions are Excellent Examples of Boats — Built By Different Builders from Same Plans

MUCH interest has been aroused by the remarkable success of the runabout Rainbow in winning the Fisher Trophy race in hotly contested events on two different occasions. This boat designed to conform to the rules of this race is considered one of the finest runabouts in America today. She was completed in 1920 from designs by George F. Crouch for H. B. Greening of Hamilton, Ontario. She has been transported by rail to races in all parts of the country, having been loaded and unloaded from freight cars no less than seven times. Her condition today is equivalent to that of a new boat. Rainbow has competed in three series of Fisher-Allison races, winning two, and making her best time of 39.6 in the third race at Buffalo. A single two mile lap was made at the rate of 41.1 miles while the total for 150 miles was 38.3 miles.

Recently a 35-foot design in general similar to Rainbow has been perfected by Professor Crouch and several hulls have been built from these plans by different builders. Among these are Sayonara, built for H. T. Vars of Buffalo; Prohibition, built for J. H. Hillman of Pittsburgh and Muskoka. Another one for Col. Thomas A. Duff of Toronto, and still another for Dr. George A. Stephens of Syracuse. These boats are in general similar and are the fastest boats of their types in their respective localities. They will all carry from six to eight persons at high speed and apparently the load has no effect on the Sterling Dolphin motors with which they are powered, as they are enabled to maintain 1,900 revolutions of the propeller irrespective of the load.

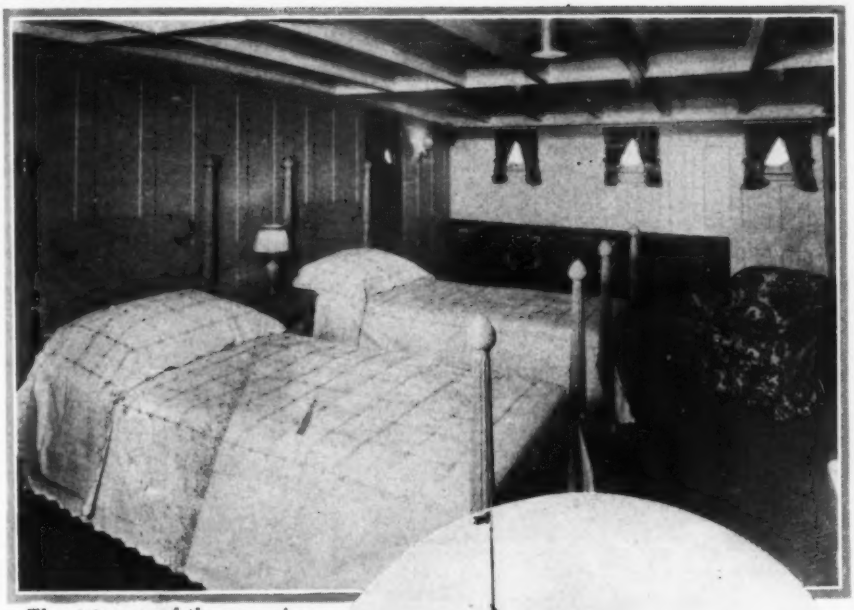
The Fisher Trophy races have accomplished the principal purpose and produced a wholesome type of boat, good for every day service while the Sterling power plant in these has amply demonstrated that it is capable of consistent high speed and good for many years.

Unusual views of Prohibition, a 35-foot Fisher trophy runabout owned by J. H. Hillman of Pittsburgh

Photographs by M. Rosenfeld

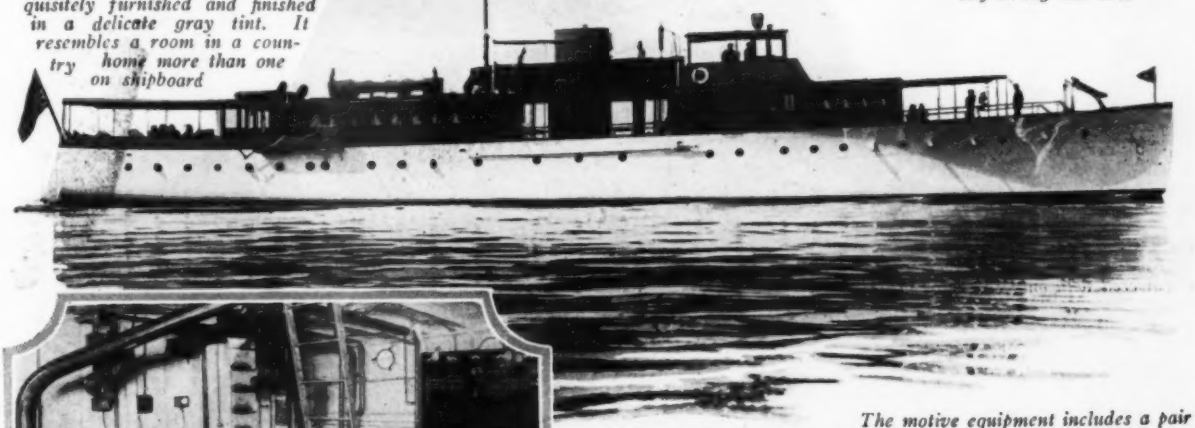
Alida, A Modern Yacht

Marine Engineering Science Produces a Perfect Craft



The stateroom of the owner is exquisitely furnished and finished in a delicate gray tint. It resembles a room in a country home more than one on shipboard

Alida, was built for Bertram H. Borden and is 135 feet in length by 20 feet beam. The hull is of steel throughout and exceptionally strong and able



The motive equipment includes a pair of six-cylinder heavy duty Speedway gasoline motors. These are of 11 by 12 inch bore and stroke and drive twin screws. Steel plate bulkheads separate the engine room from the other compartments

Forward and after portions of the deck house provide spacious accommodations for a living or lounging room and the dining saloon. The companionway shown leads to the owners and guests quarters below. Still further aft is an open lounge sheltered from the weather on all sides

Helmsmen Help to make Success Of Closing Regatta at Buffalo

Photographs by M. Rosenfeld

The crew of Arab VII which raced for the Leary Trophy. Commodore Sidway, owner of the Arab family is at the wheel

Commodore F. G. Ericson of Toronto, who drove Nick Nack in the Buffalo races. Nick Nack, which took second place in the 1100 cubic inch class performed very creditably considering the fact that she is a 32-foot runabout and is powered with only 825 cubic inches

Ed Grimm and his mechanician, who piloted Miss Peerless II, Miss Mary, and Miss Peerless I in three classes at Buffalo. Miss Peerless won the Leary Trophy for 1100 cubic inch hydroplanes

Jay Smith and George Wood, crew of Baby Gar II which won the Trophy in the 2200 cubic inch class

Bernard Smith and the Editor of MoToR BoatinG, *the crew of Baby Gar Jr. which took first honors in the 1100 cubic inch runabout class and third place in the 2200 inch class*

modore Clar- At the right: Vice Com- ence Sidway of the Buf- falo Launch Club, the man in charge of the arrange- ments at the Buffalo re- gatta as well as owner and helmsman of his runabout, Bone Dry

Above: the crew of Sayanora with the owner, Addison T. Vars at the wheel

Mrs. Ericson and her daughter, Lorraine, two interested spec- tators at nearly all the regattas of 1922

Above: Laughing Paul Strasburg at the helm of Wood Fish, Edsel Ford's Hacker built run- about which set up a new world's rec- ord of 53.6 miles per hour in the runabout class

At the left: The crew of Baby Holo, owned by Horace E. Dodge of De- troit, set up a new world's record for single engine hy- droplanes

The crew of Belle Isle Bear Cat. Richard Locke and Hoyt. Belle Isle Bear Cat is powered with a 4-cylin- der Hall-Scott Marine engine

Dawn aground on the bar in a heavy sea with the crew ready to abandon ship

Dawn on the beach at low tide

Both boats were examined and repaired between tides

When a Wreck Is Not a Wreck

Science Applied to Yacht Construction Pays Dividends Under Adverse Conditions

By Wm. T. Donnelly
Consulting Engineer

SINCE the beginning of time, man has been learning to put together and fabricate strong material into sturdy ships, and the lure and hazard of the sea and adventure to far places of the earth, has always had great attraction for him, and through all that time, there has been another and dreaded side to the picture, for the sea is not always calm and the sun does not always shine over the waters. When the winds blow and the skies are dark with clouds, the aspect of the sea changes from one of great attractiveness to one of terrible menace.

The powers of water and wind when working together as elements of destruction, are so great that no man has yet been quite able to make a structure that will resist them, but his endeavors have and should always be directed towards making them more safe and the story which is to follow, which tells of a shipwreck which was not quite a shipwreck, adds a page to the progress in the construction of ships, which it is believed will for all times reduce the hazard of the sea.

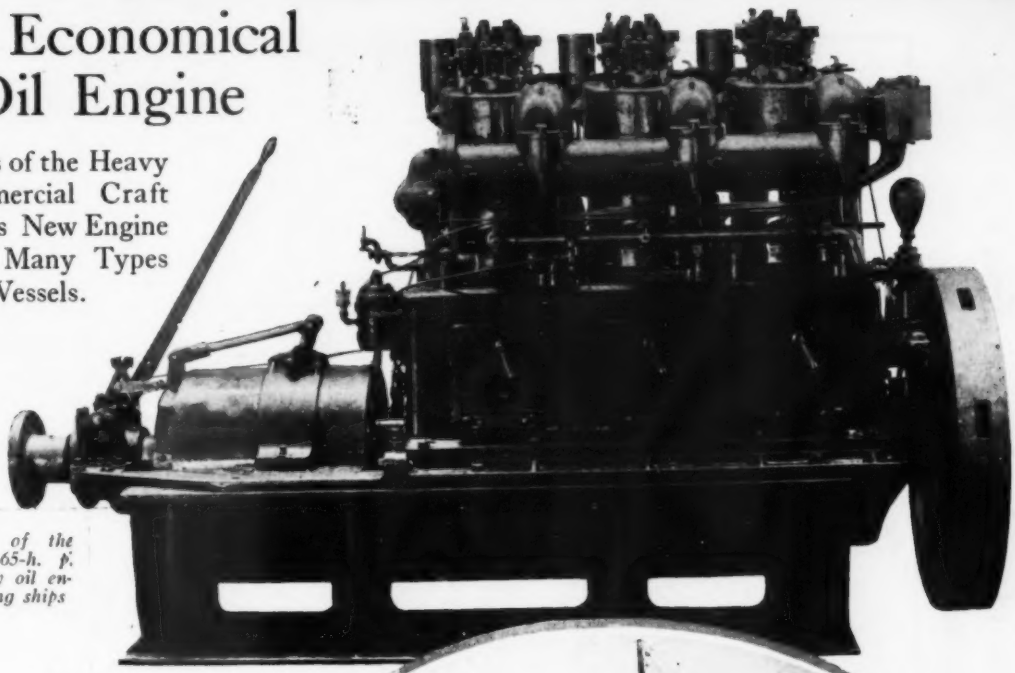
Dawn and New Era, two electrically propelled yachts which in the past two years have sailed together more than 8,000 miles up and down the Atlantic Coast, left Georgetown, South Carolina, in the afternoon of April 26, 1922, and dropped down to the breakwater at the mouth of Winyah Bay, prepared to make the outside run on the broad Atlantic, from that point to Beaufort, North Carolina.

To those who are not familiar with the story of Dawn and New Era, it should be said that Dawn carries an electric generating plant of sufficient capacity to

(Continued on page 92)

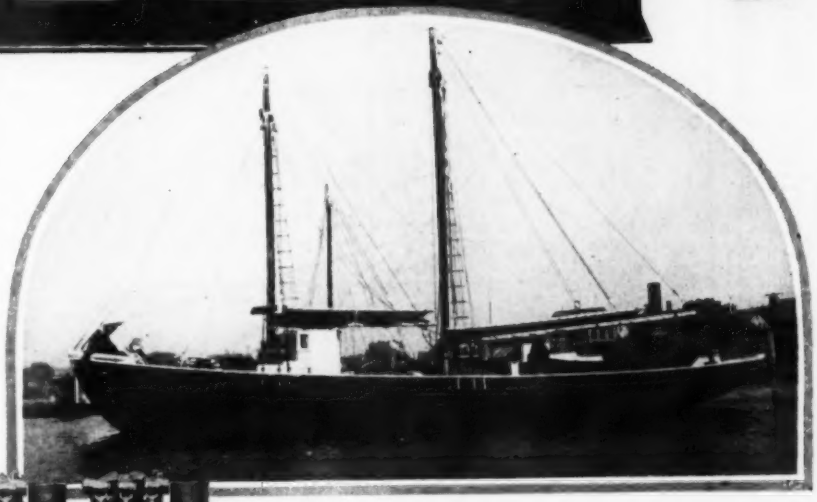
An Economical Oil Engine

Requirements of the Heavy Duty Commercial Craft Met By This New Engine Suitable for Many Types of Vessels.

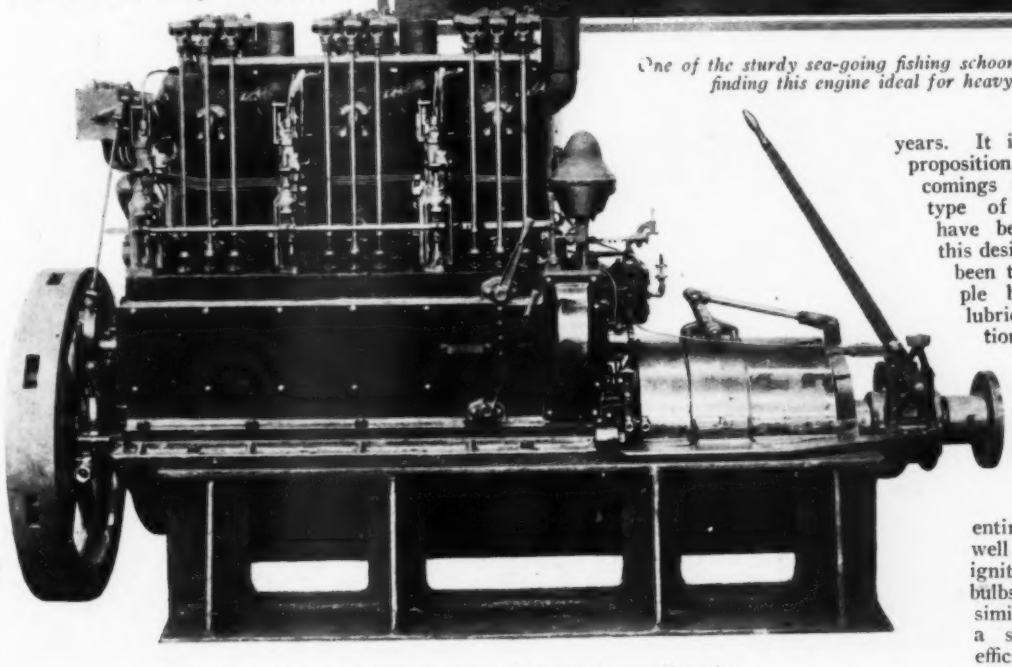


Starboard side of the three cylinder 65-h. p. Wolverine heavy oil engine for sea-going ships

IN order to supply the need for a substantial engine in large units capable of burning crude oil or any other type of fluid unrefined oils, a heavy oil engine has been perfected by the Wolverine Motor Works at their plant in Bridgeport. This machine is of the highest economy in fuel and lubricating oil consumption. It will develop its power at the rate of 15 horse-power to the gallon of fuel in actual service. This economy in fuel is equalled only by the very large sizes of crude oil engines and is not general in smaller units. This machine has been perfected after extensive experiments and research over a period of several years. It is not an untried proposition. The many short comings of the two cycle type of hot-bulb engine have been eliminated in this design. Economy has been the guiding principle both in fuel and lubricating oil consumption.



One of the sturdy sea-going fishing schooners which are finding this engine ideal for heavy service



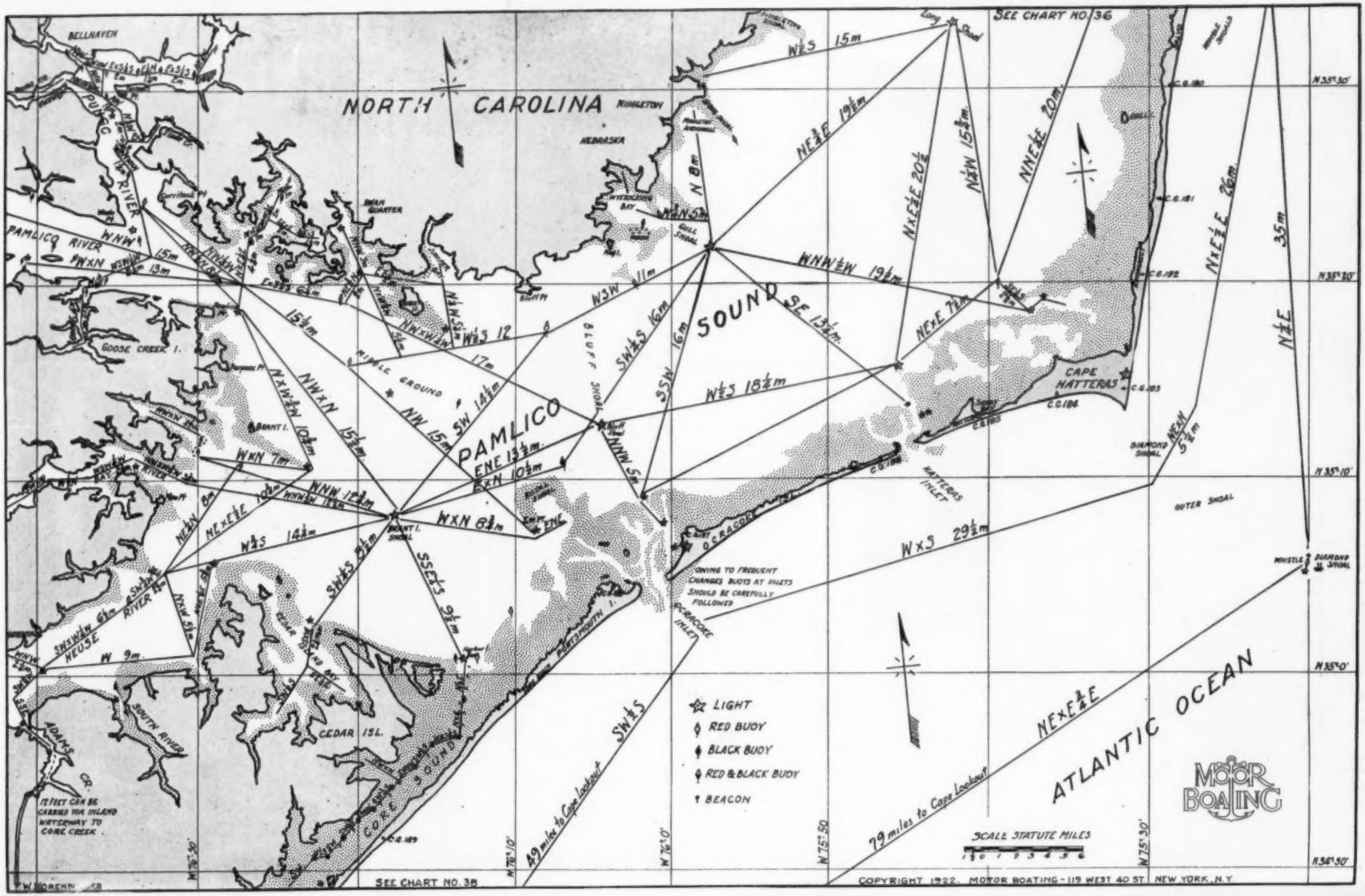
The port side of the three cylinder Wolverine heavy-oil engine

The Wolverine heavy oil engine is neither a hot-bulb semi-Diesel machine or Diesel machine. Air injection has been entirely eliminated as well as all manner of ignition devices, hot-bulbs, carbureters, and similar fitments. It is a simple, yet highly efficient engine with

(Continued on page 88)

Motor Boatmen's Chart No. 37 - Pamlico Sound - North Carolina

For Use In Connection with Coast and Geodetic Survey Charts Nos. 421, 1231, 1232, 1233.



The elaborated native dugout canoe equipped with power

A Dugout Motor Cruiser

An Undiscovered Henry Ford of Balboa, C. Z., Builds An Unprecedented Eagle Boat From a Native Indian Cayuca

ONE of the commonest sights in Central American waters is the dugout canoe of the natives—a seemingly frail, unseaworthy craft hollowed from a single log of wood. The type varies according to the locality in which it is built, some having fish tails and some not—for there are architectural fashions among the Indians as well as among the whites—but there is one characteristic peculiar to them all. They are, despite their appearance, seaworthy. On any morning when the trade-wind blows (and it blows every morning in the Caribbean) you will see the natives miles offshore, sailing or fishing, their cayucas, as the canoes are called, riding the waves as buoyantly as metallic lifeboats.

Accustomed to paddling from childhood, and being reluctant to purchase gasoline at sixty cents a gallon, it has never occurred to the Panamanians to equip their canoes with power, and it remained to F. C. Gibson, of Balboa, Canal Zone, to establish a precedent which, if it will not be duplicated, at least shows what can be done with a cayuca.

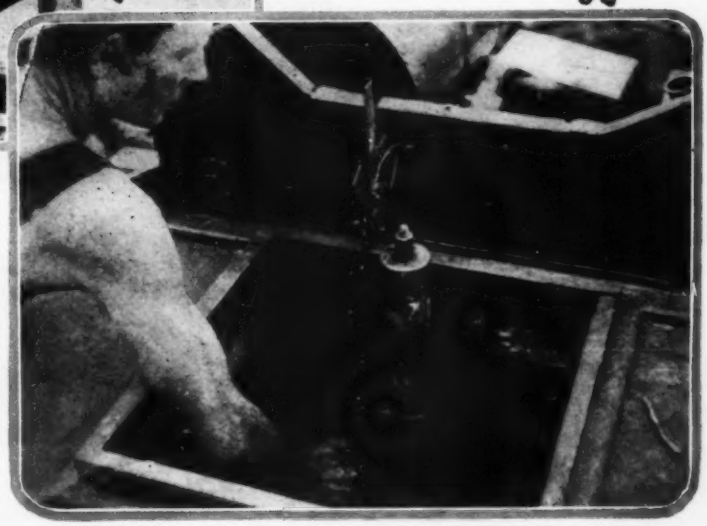
Fred—or Red—Gibson lives on an island in the Pacific, or in his cayuca, or in the jungle, or wherever he happens to use his hat for a pillow, and occupies his waking hours with being a genius. He is one of those Henry Fords who just didn't chance to invent an automobile, but can make anything else out of a tomato can and a bar of solder. Consequently, he was the ideal person to buy a 28-foot cayuca and convert it into an Eagle boat.

This cayuca, which is of Chagres River origin, was hollowed by Indians from a native wood known as espavé, which is similar to our yellow pine. Its completed beam was 3½ feet, wide enough for an Indian who can sit all day without moving, but insufficiently roomy for an American who likes to stretch his legs a bit aboard his yacht. Wherefore, the first thing that Gibson did in converting his possession was to superimpose a six-inch flare of galvanized iron, which not only widened the beam, but increased the freeboard.

Then the plans called for a few inches added to the cayuca's bow, better to adapt it to the expected increase in speed, and for an extra foot or so at the stern. After some experimentation, squat boards were provided, as is shown in one of the illus-

(*Continued on page* 88)

The afterbody showing the portion built on above the hull as well as the propeller and squat boards



The home-made lubricator installed in the lazarette permanently connected to the three main bearings

Fig. 1. With the bight of the rope start as for a bowline

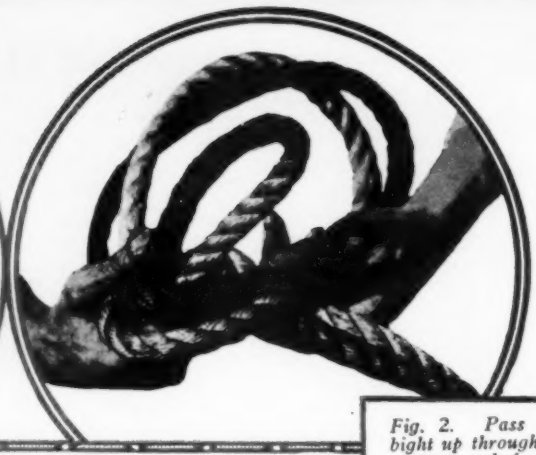


Fig. 2. Pass the bight up through the loop as before

Bowline On the Bight

A Handy Knot When the Ends of a Line Are Not Available, Useful When a Person Must Be Hoisted or Lowered on a Rope, One Bight Can Be Used to Sit In While the Other Goes Around the Body

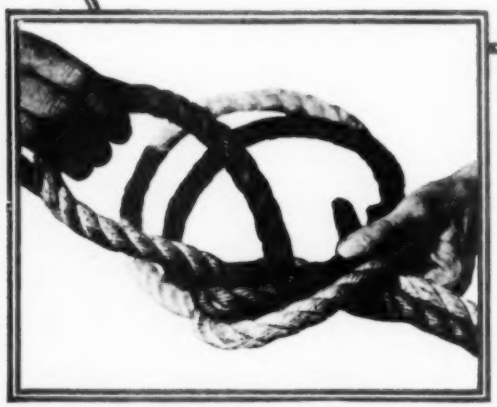


Fig. 3. Take this bight in the right hand and, instead of passing it behind the standing part, pull it down

Fig. 4. Then pass it over the whole bowline

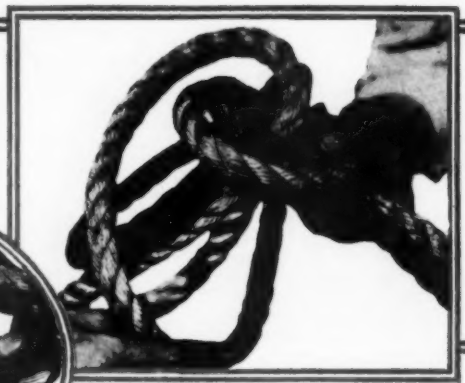


Fig. 5. Next bringing it up behind

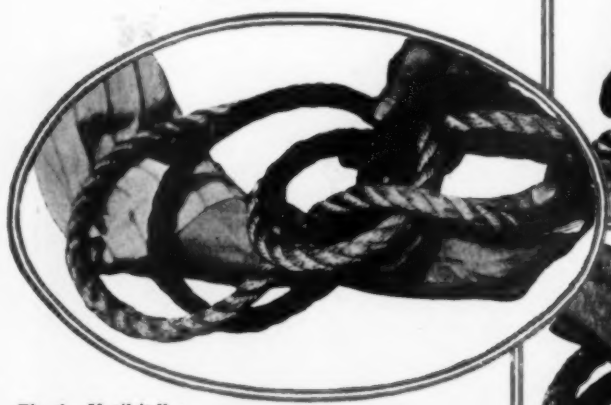


Fig. 6. Until it lies above the small loop held in the left hand

Fig. 7. Then take the standing parts and the two parts of the bight below the left hand loop and pull tight

Photographs by M. Rosenfeld

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the January Prize Contests

Describe the best arrangement for a galley. Illustrate any improvements or time saving devices that you have installed.

(Submitted by C. M. L., Mt. Clemens, Mich.)

Describe and completely illustrate a simple radio receiving outfit for an average cruiser. Outfit to be used for receiving weather and broadcasts.

(Submitted by A. I. D., Detroit, Mich.)

Rules for the Prize Contest

ANSWERS to the above questions for the January issue, addressed to the editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before November 25, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before November, 25. The editor reserves the right to make such changes and suggestions in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are two prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer both.

For answers we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Strong and Substantial Rudder Construction

Several Original and Valuable Suggestions for Improving the Rudder Installation on the Small Motor Boat

Answers to the Following Question Published in the September Issue.

"Explain and illustrate the strongest and best rudder construction and installation for a cruiser."

Outboard Rudder, the Favorite

(The Prize-Winning Answer)

FOR the small cruiser the outboard rudder seems hard to beat. If profiled correctly it adds a finishing touch to most any boat, especially so in the smaller classes where the usual run of boats are short and chunky. Considering that it takes up less room than the inboard type and that it can be easily removed for inspection and repair, it is hard to understand why it is not in universal use.

The drawing shows a rudder suitable for cruisers up to about 30-feet. Most of the dimensions must of course be taken off the particular boat for which it is intended. The only thing to remember being, the placing of the pintles as far apart as possible.

On a boat with generous freeboard it would be best to run the tiller through the stern board sheaves and tiller lines underneath the deck as usual, not forgetting to build a hatch over the tiller, from where the boat could be steered in an emergency.

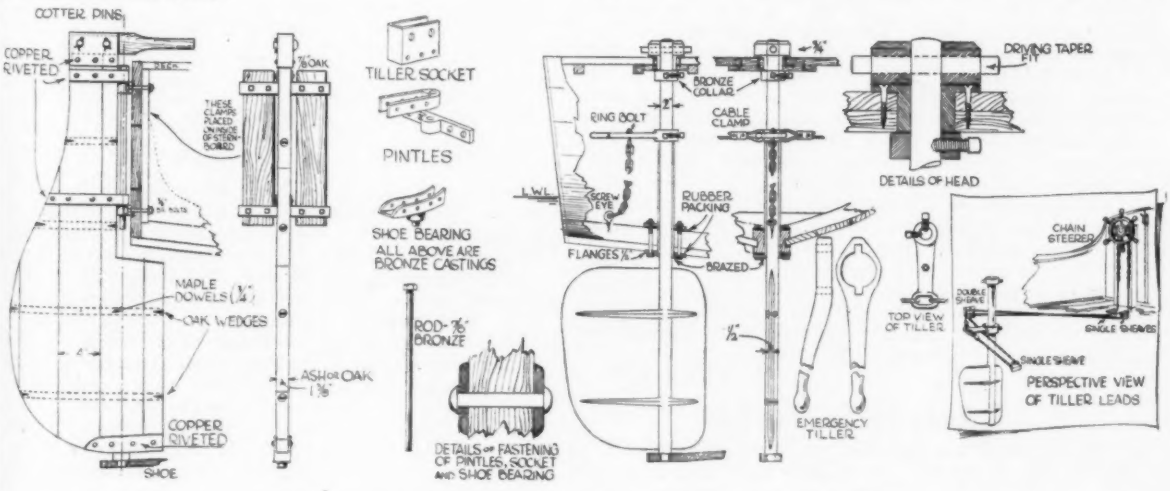
The rudder is made up of a number of 1⅜-inch planks, the widths of the individual pieces not exceeding 5-inches. All edges are given a coat of paint before assembling. The maple dowels are spaced every eight inches. The ends are split and oak wedges are driven in.

Pintles, shoe bearing and tiller socket are bronze castings and are copper riveted to the rudder. Clamps of ⅞-inch oak are placed on inside of stern board, so as to distribute the strain at the pintles.

The tiller is of oak and is held in the socket by two bolts and cotter-pins. To remove rudder it is only necessary to take out cotters, tiller, and rod, which would require but a few seconds.

If tiller is kept on deck, the ordinary rope steerer would suffice, using rope with a cable center. If tiller is brought through stern board, the chain steerer with cable tiller lines would be best. This is illustrated in sketch of inboard rudder.

For larger boats, I think an all bronze outfit would best fill the bill. This would be inboard as room would not be



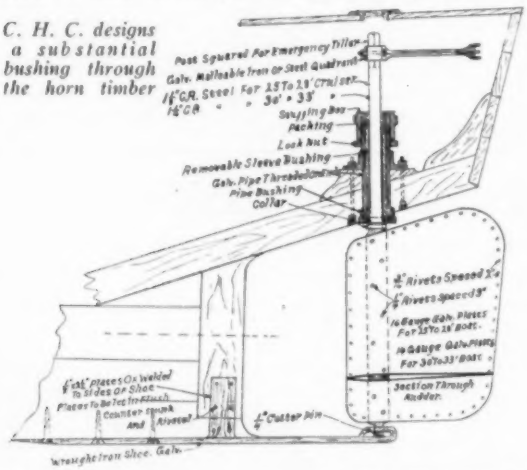
A large variety of rudder designs suggested by H. J. are practical

at such a premium. Like the outboard, most of the dimensions would have to be filled in by the prospective builder to suit his own requirements.

The stock blade and shoe bearings are cast in one—the blade being ribbed for strength. The tube through which the stock passes is of bronze having a wall of ¼-inch thickness, passes through the keel and extends a good distance above the waterline. The outer flange is brazed to tube, the inner flange is loose. Three-sixteenth inch sheet rubber packing is placed between inner flange and keel and outer flange and keel. Four ⅜-inch bronze bolts pull everything together.

The stock goes through to the deck where a head is fixed. This head is held in place by means of a taper pin, in the form of a bronze rod ¾-inches in diameter. About an inch of the pin is allowed to project at each

C. H. C. designs a substantial bushing through the horn timber



end; these stubs serve as keys for the emergency tiller which should be kept in the near vicinity.

The head rests on a bronze flange which is screwed to the deck and filler piece by means of brass flathead, countersunk screws. On the underside a brass or bronze collar is firmly held to the stock by two ½-inch cap screws. This collar allows of no upward motion of the rudder; in other words it would be impossible for the rudder to be thrown up and out of the shoe and then dropping down beside it, allowing the rudder to swing in one direction only. I have seen the result of this peculiar accident recently.

The tiller held to the stock by two ½-inch cap screws rests upon the rudder tube. This and mainly the head on deck allow of no downward motion. The shoe could drop off but these two checks would make it impossible for the boat to be crippled in this way.

This rudder is to be used with a chain steerer and bronze cable tiller leads. This type has an iron drum with recesses around its periphery which just match the links of a short length of chain. It's action is similar to that of a chain and sprocket and it is just as positive, yet much stronger. Being of the simplest possible construction the numerous small parts which go to make up a sprocket chain are avoided. The cable is fastened to both tiller and chain by means of cable clamps.

A short length of 3/16-inch galvanized chain is dropped from the tiller to the keel. This is to restrict the swing of the rudder, and to prevent the end of the chain at the steering wheel running past the drum. All set screws are to be sunk into the shaft.

Both rudders are of the balanced type which are most efficient. It is only necessary to extend the blade a few inches on the propeller side of the stock.

H. J., New York, N. Y.

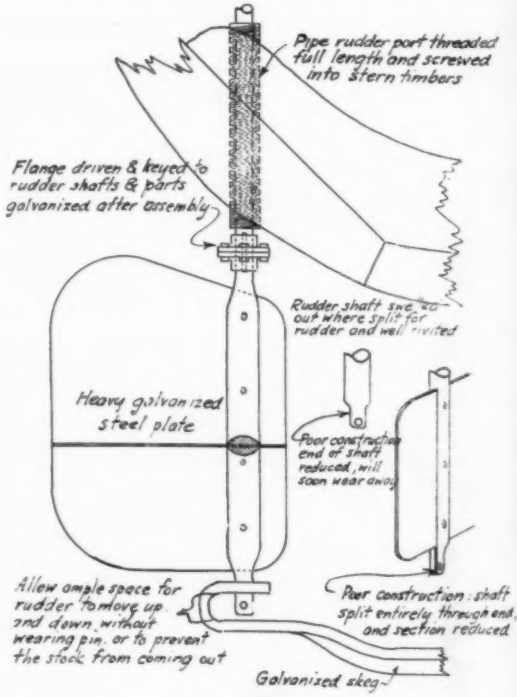
A Substantial Rudder

SOME prefer an outboard rudder, arguing that it is cheaper to build, more durable and easier to repair. Others like myself believe that the inboard rudder, if properly constructed and installed is entirely satisfactory for the purpose intended and leaves a neater and better looking stern on the average cruiser. The quadrant and tiller lines are under the aft deck out of the way, and without the necessity of carving an unsightly hole through the transom for the tiller. From my own experience rudder repairs are hardly worth considering. I've always built and installed the rudder to outlast the hull, and then forget about it.

So the rudder shown is of the inboard type and somewhat different in construction to that usually employed for small boats. While the usual pratice is to use a single blade of plate and split or divide the post, in this rudder the post is an ordinary piece of round steel of bronze if preferred forged or flattened down to about one half diameter with a plate riveted on either side and the edges riveted together thus leaving a smooth, unobstructed surface for the flow of water and also providing what I believe to be an exceptionally strong job.

Other advantages are that a rudder of this description is easily built by anyone with the tools and equipment usually found around any small shop, and if reasonable care is taken in doing the work, a very neat and satisfactory job is sure to result.

Use ordinary cold rolled steel shafting for the post to avoid lathe work on upper end, unless a bronze rudder is required. This post may be galvanized after forging for salt water use. For fresh water boats this is unnecessary as the post will outlast the hull. Use galvanized iron plates for the blades cut to required shapes. Drill and rivet plates


Pipe rudder port threaded full length and screwed into stern timbers
Flange driven & keyed to rudder shafts & parts galvanized after assembly
Rudder shaft swelled out where split for rudder and well riveted
Heavy galvanized steel plate
Poor construction end of shaft reduced, will soon wear away
Allow ample space for rudder to move up and down without wearing pin, or to prevent the stock from coming out
Poor construction: shaft split entirely through end, and section reduced
Galvanized skeg

A neat design by H. H. P. embodies good features

through flattened post as shown using ¼-inch Swedes iron rod for rivets. Countersink plates slightly so rivets will be flush when finished. Now draw edges of plates together. Drill 3/16-inch holes 2-inches apart all around edges countersink on both sides and rivet flush with 3/16-inch Swedes iron rod. Do not hammer or distort plates but allow them to take a natural curve.

Pehaps the greatest disadvantage of the ordinary inboard rudder is the difficulty of unshipping this type when the lower end is stepped into a substantial shoe as it should be in an ordinary cruiser. When repairs to the shaft become necessary, the rudder frequently prevents its removal, so means for unshipping the rudder should be provided in order to permit the removal of propeller shaft. This could be accomplished by making a section of the shoe removable. The

(Continued on page 102)

Convenient Water Supply Systems

Clever Arrangements Provide Running Water at All Times to the Galley of the Small Cruiser

Answers to the Following Question Published in the September Issue

"Describe a water supply system to galley sink; location of tank method of running piping and means provided for filling and cleaning out the tank."

Choice of Water Systems

(The Prize-Winning Answer)

THERE are numerous systems of water supply for use on the motor boat. The selection of a system is governed by conditions and requirements of each particular case. The accompanying diagram indicates systems to which features may be added or taken away to suit almost any requirement.

The simplest system is the gravity system which consists of a tank placed high enough to permit the water to flow by gravity to the fixtures supplied. The size of this system is limited by the tank storage space available, and by the fact that too much weight placed high would tend to produce instability in the vessel.

Another system is to have the tanks placed in the bilge or under the cockpit floor, with a hand water pump at each fixture. This arrangement keeps the weight low and would tend to increase stability.

The latter system may be improved upon by using the whistle air compressor outfit to provide the means of raising the water. In the event of the lack of sufficient pressure due to not running the engine at times, a hand pump is arranged to provide the required air pressure. With this system the hand water pumps at the fixtures may be retained instead of providing the hand air pump. In this case a check valve should be provided at the tanks to retain the compressed air and also to admit air to the tanks when it is necessary to use the hand water pumps.

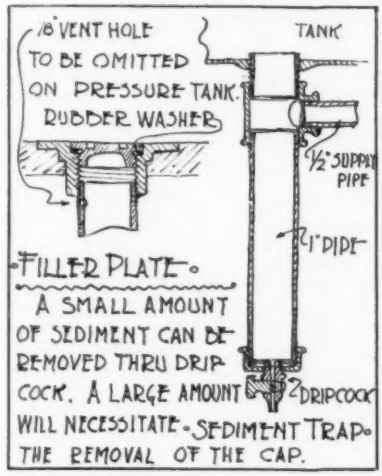
The filler plugs should be provided with rubber washers so as to keep the water clean, and hold the air in the case of the pressure system. The other system would require a small vent hole just below the deck to admit air as the water is drawn from the tank.

The tank connection should be provided with a sediment trap, which is a simple matter. It consists of a nipple six or eight inches long screwed into the tee, with a drip cock tapped into a cap on the bottom, as indicated on the sketch The amount of sediment that will accumulate in a season is surprizing. By inserting a piece of wire in the stop cock some idea of the amount of sediment collected will be obtained. The removal of a large amount will require the unscrewing of the cap.

The piping should be of galvanized iron or brass, of ample size, not less than one half inch in diameter, so as to provide a good flow and reduce friction when using the hand pump. The piping should also be provided with ample drain valves or cocks at all low points, to permit easy drainage of the entire system in the fall of the year, so as to prevent broken pipe due to freezing.

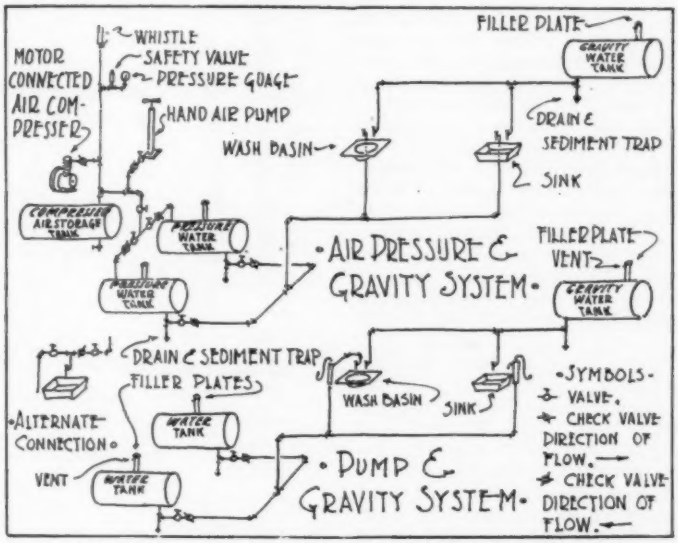
If water is likely to be scarce due to the difficulty of getting it and also due to small tankage, the faucets on the pressure and gravity systems should be self-closing, especially in places where they may be used by children or people unaccustomed to the difficulties of getting water on small boats, so as to prevent any possible waste of the precious liquid.

A. G. W., College Point, N. Y.


⅛" VENT HOLE TO BE OMITTED ON PRESSURE TANK.
RUBBER WASHER
TANK
½" SUPPLY PIPE
1" PIPE
FILLER PLATE.
A SMALL AMOUNT OF SEDIMENT CAN BE REMOVED THRU DRIP COCK. A LARGE AMOUNT WILL NECESSITATE THE REMOVAL OF THE CAP.
DRIPCOCK
SEDIMENT TRAP.

Favors Pressure for Water Supply

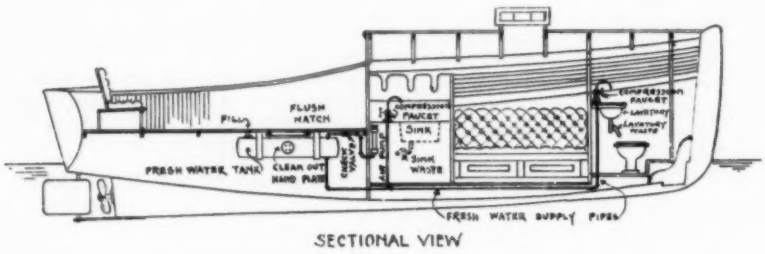
MUCH might be written about water supply systems, but the ideal system will be found only when you may have running water on tap at any time, at either the galley sink or lavatory without a lot of pumping, running water the same as you enjoy at home in your bathroom or kitchen. On the accompanying drawing is shown a method which will provide running water wherever it may be required on board the boat. This is accomplished in a very simple manner. Start with utilizing space ordinarily wasted under the cockpit floor for a storage tank of ample proportions, the tank being secured to the underside of the cockpit floor by wrought iron straps. The filling of storage tank being through filler in cockpit floor. In the tank is provided a hand hole with plate for cleaning purposes, and a flush hatch is provided in the cockpit floor over the clean out hole in tank. Leading from the bottom of the tank the necessary piping is arranged, leading to the galley sink and lavatory faucets, the piping being either of galvanized wrought iron or lead and of about ⅜-inches diameter. The faucets should be of goose-neck brass or nickel plated compression type, (opening and closing the same as house faucets). All that remains to complete the installation is to connect a small air pump by means of suitable piping to tank, similar in size and style to a bicycle tire pump, placing a check valve in the line between the tank and pump. After filling the tank with water, screwing cap in place at the fill pipe, a few strokes of the air pump will provide sufficient pressure to cause the water in tank to flow from the faucets whenever they might be opened. The tank capacity will of course depend on the space available, and should be of galvan-



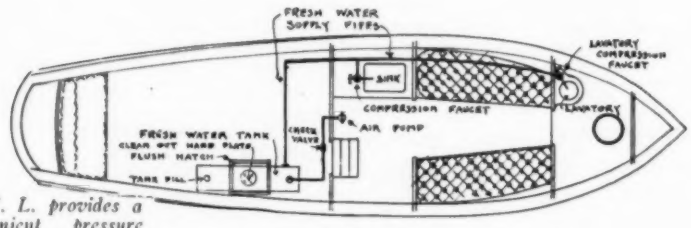
A choice of water supply methods is offered by A. G. W. in this sketch

ized iron, with riveted or welded seams, preferably of cylindrical shape, and of substantial construction so as to stand a reasonable pressure. All the joints in the pipe lines should be screwed up air tight, or wiped if lead is used.

All pipes should be securely strapped with pipe straps, placed at proper intervals, so as to prevent rattling, due to vibration. I have found a water supply system, such as this to be all that can be desired, as it provides fast running water at all times, allows one the use of two hands while drawing water, and does away with a lot of pumping and the squirting of water all over everything as is the case with suction pumps. Enough air pressure can be stored



SECTIONAL VIEW



PLAN

F. W. L. provides a convenient pressure system.

in the storage tank in two or three minutes to last practically all day.

F. W. L., New Brighton, N. Y.

Water Necessary to Every Galley

ANY cruiser worthy of the name now has a galley and one of its essential features is a convenient supply of fresh water. The system may be no more elaborate than a stone jug or a tin pail, but without fresh water the galley is useless. A more convenient means of supplying fresh water to the galley is desirable and the installation is practical on any cruiser over thirty feet in length.

The pressure system is the most modern, equaling city water supply in convenience. The gravity system will deliver the water upon opening the faucet but has the disadvantage of tank location. In the pump system the tank may be more advantageously placed and only a few strokes of the pump are necessary to raise the water. In the pressure system the tank, or tanks if space is small, may be located under the floor, out of the way, and where it is always cool. Unless placed under the cockpit floor the tank will generally have to be made to order, but whether special or stock it should have hand holes large enough to reach through to every part of the tank. If over 15 gallon capacity the tank should have splash plates to prevent the shifting of a large quantity of water at one time. This applies to all systems.

Water will keep longer and better in a tinned copper tank than in any other kind. However, galvanized tanks are very commonly used.

No one position can be given as the best tank location. The construction and trim of the boat will determine the location. For the pressure or pump system under the cockpit floor would seem a good location. Generally the lower the tank the cooler it will keep, therefore, on some boats where low ballast is efficient put the water tanks under the cabin floor. Located amidship the weight of the tanks and their contents will have least effect on the trim of the boat. A boat which is heavy forward, or down by the head should naturally have her tanks aft.

In the gravity system it is necessary to locate the tanks a little higher than the outlet to secure a good flow. Gravity feed tanks are sometimes located on deck or hung from the carlins. In either location the water will be warm and will not keep well. Where the cockpit floor is of sufficient height the water tank may be placed under a seat or in a locker built to receive it.

In any system the tanks and all piping should be installed so as to drain through a valve or plug at the lowest point. Lead pipe is not advisable owing to the danger of lead poisoning from the water standing in the lead. Half inch brass or galvanized pipe is best and the outlet should be a spring closing bibb as it tends to prevent wasting the water.

When making up connections dope only the thread on the pipe and practically no dope will get on the inside and into the water.

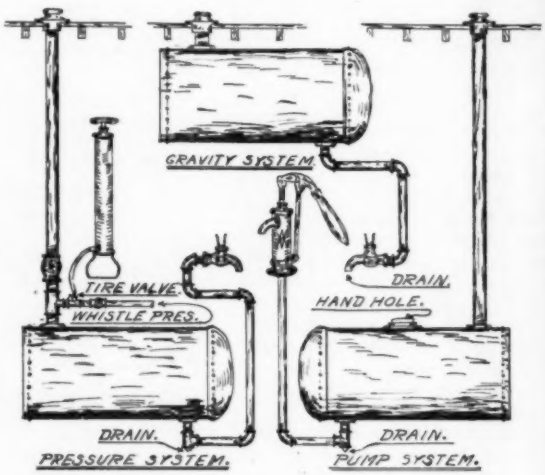
The filler pipe in any system should be carried on deck where a raised deck plate is fitted. This will prevent spilling inside the boat and eliminate the chance of dirt or foreign matter getting into the tank, and it is also handiest for filling with either hose or pail.

In the pressure system the pressure may be supplied from the whistle tank if a compressor is used. Do not use pressure from an accumulator on the motor cylinder as the gas would soon spoil the water. But little pressure will be required to deliver the water and where the whistle pressure is not available a few strokes on a good tire pump does the trick. Install the pump anyway as you may want water when there is no pressure. With this system a valve in the filler pipe is advisable as the deck plates are seldom watertight.

The tank can be cleaned through the hand holes with soap and water or scouring powder the same as any kitchen utensil. Where a hose is available, tie the outlet open and let run through the system for a while after cleaning.

Perhaps you will use a tank without hand holes. Then the only means of cleaning it is to introduce a strong soap powder solution through the filler pipe on a rough day and let it splash around. Draw off through the drain and rinse with clean water.

W. B. M., Newburgh, N. Y.



W. B. M. Shows Several Typical Piping Arrangements

Priscilla, A High Speed Monoplane

A New Design For a Fast Little Boat—Complete Drawings, Specifications and Building Instructions

Designed Exclusively for MoToR BoatinG

By John L. Hacker

FOR the young fellow who is anxious to have a fast little runabout, this design should have a particularly strong appeal. The cost of the material for a boat of this kind is not very high and the biggest items of expense are a suitable power plant and the labor costs of constructing the hull. As mentioned previously, on many other occasions the construction will follow the usual methods for this type of boat. As a sport runabout of the legitimate type this boat will be exceedingly fast and safe. As arranged, a light motor of any horse-power up to about 150 will be very suitable and will give surprising speed. A hull of this size when fitted with a motor of 100 horsepower has been driven close to 40 m.p.h. without undue effort. A reduction gear will be necessary with this outfit however, but since there are several of these on the market no difficulty should be experienced in procuring a suitable one. The boat as arranged is fitted for a single seat to accommodate three passengers very nicely. A little boat of this kind will provide a great deal of rare sport and should prove to be one of the most popular of the present series. This little boat is a very seaworthy model and one which can be depended upon to get you there and back again.

Among the most essential necessities for building this boat is naturally a suitable structure sheltered from the weather so that the hull will be protected until it is completed. A complete assortment of wood working tools is also very necessary as well as a steam box big enough to include the largest piece to be handled. The first thing to prepare is a smooth floor of sufficient area to permit the keel to be laid out to its full length. It will be necessary to draw out the lines to full size on this floor. All dimensions given in the table of offsets are to the outsides of planking and plank thickness must be deducted to arrive at the proper line for the molds. Strike in a base line by means of a chalk line and then pencil it in with a straight edge. Fifteen inches above this run the load water line exactly parallel to it and erect the station lines perpendicular to these. Now draw in the sheer lines, deck lines, chine lines, and keel bottom as well as the body plans to show the lines which will give the molds. The curves of the mold will have to be drawn by means of battens which will bend to the required shape. After the entire form of the boat has been reproduced in full size it should be carefully checked to see that all points and distances agree on all views.

Molds are prepared from any suitable material and sufficient thickness. They should be strong and true with both sides alike. They should be substantially cleated so that they will be able to support the hull during construction. The keel, stem, and transom are next prepared and erected in proper position and then the positions of the different stations marked on its upper side. The molds are then set up at these points and stayed and secured to proper alignment. They should be placed with the forward side of the mold on the station line.

Sawn frames are prepared for each of the station points of hackmatack. The intermediate frames which are steam bent are not placed until after the hull is planked. The following operation is the placing of the chine and clamp after which the seam battens are fitted and aligned carefully. The fitting of the planking is the next operation, and these should be so placed that the joint between the planks will follow the center line of the seam battens from end to end. Patience and care are all that is necessary. The joint between the planks should be very slight and uniform. They are to be lightly caulked with spun cotton. Should the hull be intended for very fast service, say over 30 miles an hour, then the hull should be double planked in which case the inner skin should be ⅛-inch thick while the outer plank can be ⅜-inches thick. They are to be separated by a layer of light canvas duck laid in marine glue. After the planking operation has been completed the deck beams, cockpit coaming, knees, and other interior fittings can be added in turn. The interior trim and bulkheads should also be prepared and put in place. The installation of the motor and shaft as well as the tanks and other mechanical appurtenances will follow in proper order and after the completion of the hull it can be painted or finished to suit. If mahogany planking has been used it will probably be best to finish this in natural finish. All work before varnishing and finishing should be carefully sanded and smoothed down as is customary so that the completed job will be smooth and clean. The specifications which follow describe the various members of the hull and their assembly in complete detail. Every item is carefully described and its dimensions given as well as on the drawings. There should be no difficulty in identifying the various parts on the drawings from their description in the specifications.

GENERAL SPECIFICATIONS

The general dimensions of this boat will be: Length overall 21-feet 6-inches, beam 6-feet, freeboard at stem 2-feet 6-inches, freeboard at the stern 1-foot 10-inches draft 2-feet.

Keel: This is to be shaped from a piece of white oak 1¾ by 4 inches preferably in one piece. If necessary to splice

STATION	0	1	2	3	4	5	6	7	8	9	10
KEEL		0-9-0	0-7-2	0-6-3	0-6-1	0-6-3	0-6-6	0-7-5	0-8-5	0-9-5	0-11-0
CHINE	2-2-2	1-10-3	1-7-6	1-5-1	1-3-2	1-1-7	1-0-5½	1-0-0	0-11-4	0-11-2	0-11-0
SHEER	3-9-0	3-8-0	3-7-4	3-6-5	3-5-7	3-4-7	3-4-0	3-3-0	3-1-6	3-0-4	2-10-7
DECK		3-11-7	4-1-1	4-1-5	4-1-3					3-5-3	3-2-0
BUTTOCK 1		1-8-6	1-2-0	0-11-1	0-9-4	0-9-0	0-8-7	0-9-2	0-9-5	0-10-2	0-11-0
" " 2				1-3-2	1-0-5	0-11-3	0-10-5	0-10-5	0-10-4	0-10-5	" " "
" " 3					1-2-5	1-0-7	1-0-0	0-11-3	0-11-1	0-10-7½	" " "
HALF-BREADTHS											
CHINE		0-8-4	1-3-0	1-8-7	2-1-2	2-4-2	2-6-1	2-7-1	2-7-0	2-6-6	2-5-5
SHEER		1-6-7	2-4-3	2-9-4	2-11-7	2-11-7	2-10-3	2-8-7	2-6-5	2-3-7	2-0-3
WATER-LINE 1		0-1-0	0-3-2								
" " 2		0-2-2	0-5-6								
" " 3		0-3-4	0-8-2	1-2-1	2-1-0	2-4-3	2-6-1	2-7-0	2-7-3	2-7-1	2-6-3
" " 4		0-8-4	1-3-5	1-9-6	2-2-1	2-5-0	2-6-6	2-7-3	2-7-3	2-6-6	2-5-7
" " 5		0-10-6	1-6-0	1-11-7	2-4-2	2-6-4	2-7-6	2-7-7½	2-7-1	2-5-4	2-3-1
" " 6		1-1-4	1-9-7	2-4-0	2-7-5	2-9-4	2-9-5	2-8-5	2-6-7		

DIMENSIONS IN FEET INCHES EIGHTHS AND HALVES TO OUTSIDE OF PLANK FROM BASE LINE

Table of offsets giving all figures for laying out frames for Priscilla, a fast monoplane

this, a scarph joint of not less than 2-feet length should be made with at least four fastenings. It is to be properly beveled and rabbeted to suit the planking and a hole bored to suit the alignment of the shaft. This hole should be ¼ inch larger than the size of the shaft to be used.

Stem: This is to be preferably from a hackmatack knee. If not obtainable white oak may be used with a knee of the same material, fastened with three ⅜-inch fastenings. It is to be shaped from 2-inch stock properly beveled and rabbeted to suit the planking. It is to be bolted to the keel in a similar manner and the rabbeting finished.

Stern: Transom at the stern to be of ¾-inch mahogany sawn to the proper shape with a cleat on each side as well as at the top and bottom of ⅞-inch oak. It is to be mounted on a 1¼ by 4-inch stern post and fastened to the keel with a hackmatack knee on each side. The transom is to be beveled to suit the planking and screw fastened to the cleats etc. with all holes wood plugged.

Frames: Frames at station points are to be preferably of hackmatack knees, in which case they are to be of 1-inch stock and are to extend from the sheer to keel and tied with an oak floor with such dimensions as are indicated on the drawings. They are to have at least six fastenings on each side and will be through bolted to the keel with 7/16-inch bolts as far as station No. 5 and with two 5/16-inch bolts through to the rabbet from here aft to the stern. The frames are to be approximately 3 inches on the bottom tapering to 2¼ inches at the top on the sides. If hackmatack knees are not used then they will consist of a side and bottom member halved at the chine. This will be of ⅞-inch stock and tied in a like manner with an oak floor. Frames beginning with No. 7 may have a continuous bottom member from chine to chine. After the hull has been planked there will be an intermediate steam bent frame 7/16 by 1⅛ inches between each station frame extending from sheer to the keel and to be tied across with an oak floor. The space in between the battens is to be filled with pine or spruce with a liberal radius piece at the chine. The floors are to be through bolted to the keel with ⅜-inch bolts.

Chines: These are to consist of an inner and outer member. The inner member is to be shaped from 1¼ by 3-inch spruce. They are to be properly beveled to suit the planking and to be rivet fastened to the frames, reinforced at the stem with an oak breasthook, and also with a knee on each side at the stern. The outer chine is to be shaped from 1 by 1½-inch mahogany and properly beveled and riveted to the inner member. There should be one through fastening into the intermediate frame. Holes in the outer chine are to be counterbored with a Forstner plug bitt and wood plugged.

Engine Stringer & Bed: The engine stringers are to be shaped from 1¼-inch aero spruce in a single length. It is to be let down over the floors and to rest on the intermediate frames, through bolted to the floors with ⅜-inch bolts. The top of the stringer will form the floor level and is to extend through to the stern being fastened to a cleat on the transom. The engine bed is to be of 2-inch white ash aligned to suit the engine to be installed and fastened with 5/16-inch bolts spaced 6 inches apart. This will also be notched over floors and to be drift bolted to them.

Strut Block: This will be a piece of oak or ash 1¼ by 8 inches extending from chine to chine and resting on the keel. Allow the full thickness on the keel and cut down to approximately ⅞ by 6 inches at the chine. This is to be so located that the strut bolts will come through it.

Clamp & Battens: The clamp to be of ⅝ by 2½-inch yellow pine. It is to be let into the frames and securely screw fastened to them. It is to be reinforced at the stem with an oak breasthook and a substantial knee on each side at the stern. The side plank battens will be of 7/16 by 1½-inch Philippine mahogany. The bottom battens will be of ½ by 1¼-inch yellow pine or oak. These are to be let into frames and securely screw fastened. The third and fourth batten may begin at the chine.

Frame in General: The entire frame is to be neatly trimmed and faired in readiness for the planking. All joints made as the work progresses are to be well painted with lead paint before making the final fastening. All fastenings are to be of bronze, copper, or galvanized iron. Where galvanized fastenings are exposed they should be painted with red lead and wood plugged.

Planking: The side planks are to consist of a single thickness of 7/16-inch mahogany. This should be of selected stock and in as long lengths as practical. They are to be so spiled as to meet centers of the battens and to have flush seams with blind caulking except the chine seam. Fit the plank flush and then make a groove in each plank, inserting in same a strand of soft seine twine. All butts to be made on oak butt blocks fitted in between the battens and not less than 8 inches long with at least six fastenings in each half. The bottom planking is to be of ½-inch cedar with exception of the two planks at the stem which will show mahogany to the water line. These are to be spiled in a similar manner to the sides, allowing a uniform seam of about 3/32 inches which is to be lightly caulked with spun cotton. All planking is to be screw fastened to the main frames using 1¼-inch No. 9 screws. Fastenings into clamp, chine, and keel should be 1-inch No. 9 screws. Planking is to be rivet fastened through the intermediate frames with 2-inch copper wire nails riveted over burrs, and to the battens with 1½-inch nails. All holes are to be counter-bored with a Forstner bitt and wood plugged. All plugs should be sized with shellac. If greater power is to be used for a speed of more than 30 miles an hour then the double planking is advisable for the bottom. In this case the inner skin should be ⅛ inch thick and laid diagonally The outer plank is to be of ⅜-inch material laid on a light canvas duck in marine glue. It is to be fastened as specified previously and holes wood plugged.

Deck beams: These are to be of white wood sawn to proper radius and securely screw-fastened to frames and clamps. They are to be reinforced with a knee on the main stations and bound with a ⅜ by ⅞-inch oak binder. There will also be a knee for additional support extending to the second batten on the sides at each intermediate frame. The main deck beams are to be ¾ by 2 inches and the intermediates ⅝ by 2 inches. The header beams forward and aft of the cockpit are to be ¾ by 3 inches while the trimmers are ⅞ by 2½ inches.

Decking: The beams are to be neatly faired and trimmed and a 7/16 by 1⅜-inch partner inserted as shown on the plans. The covering boards and center plank to be of ⅜-inch mahogany and the balance of the decking to be of 2½-inch white pine strips. A uniform seam of about 3/32 inches should be allowed. The decking is to be fastened with screws to the clamp and partner and with 1½-inch galvanized nails to the beams with two fastenings in each strip. All fastenings are to be counterbored and wood plugged. The deck is to be thoroughly dressed and sanded with the outside corner rounded off to about a ¼-inch radius. The seams are to be lightly caulked with spun cotton.

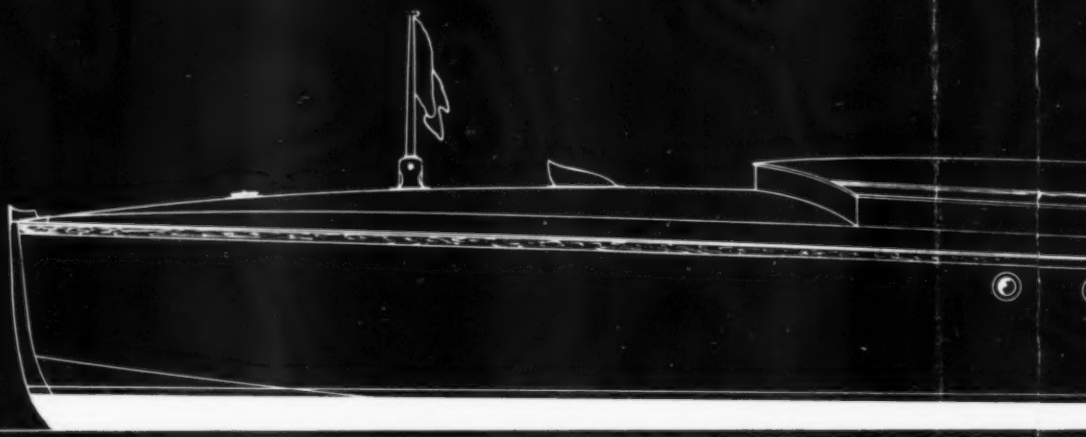
Cockpit: The coamings are to be 9/16 inches thick. The bulkhead also 9/16 and to extend from side to side to a depth to the bottom of the coaming. There will be a ⅞-inch cleat fastened to beams and engine stringers for backing. The balance above the foot rest to be in three panels screw fastened so as to be removable. Insert ⅞ by 2-inch cleats for the foot rest. After end of the coaming will be of ⅝ inches extending to the bottom of the coaming. The instrument board will be 9/16 inches with two cleats on each side and one in the center supporting a ⅜-inch cowl. Seats are to be made with a white pine top and a mahogany front of 9/16 inch material carried on a ¾ by 2-inch riser. There will be a permanent flooring under the seat and removable section forward of ⅝-inch white pine. All finish in the cockpit except otherwise specified will be of mahogany and all fastenings to be screws, wood plugged.

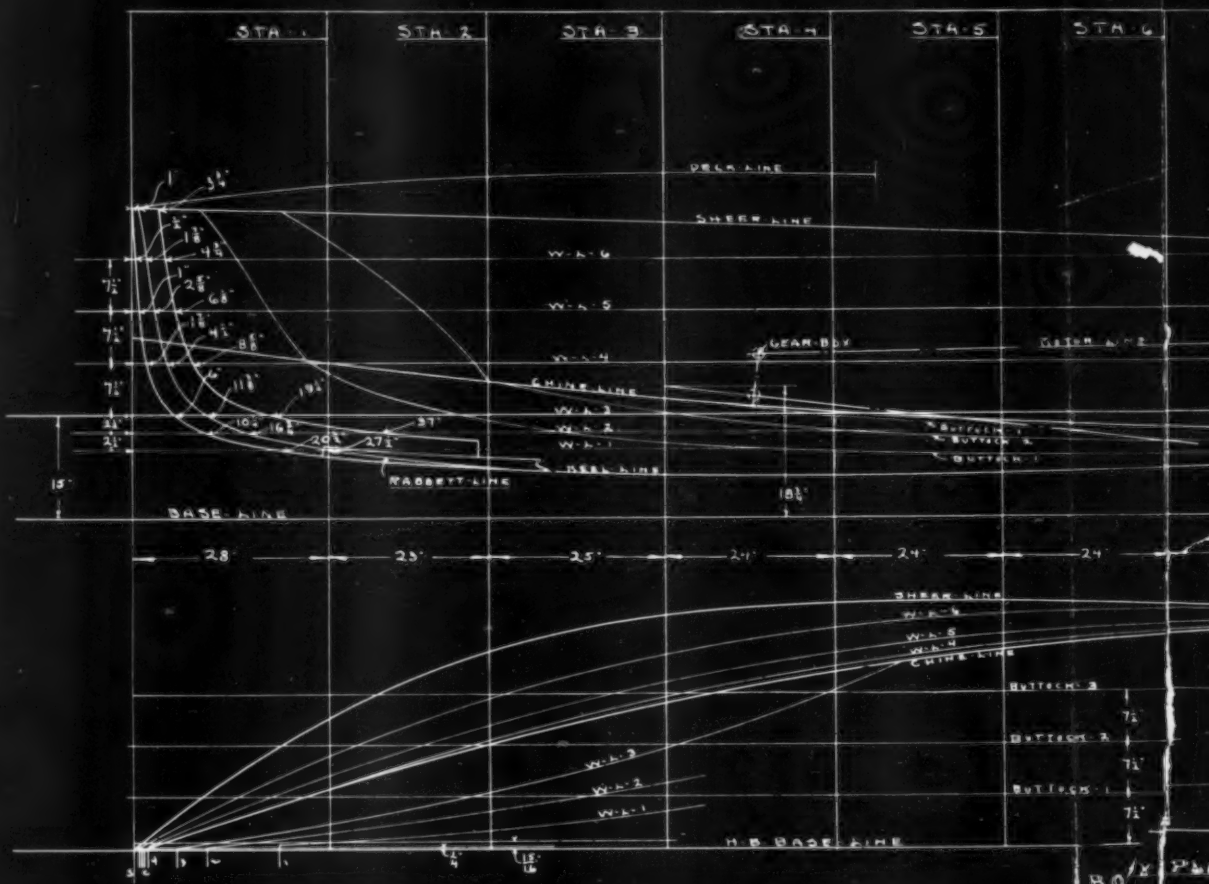
Hatch cover: Framing for hatch covers will be ¾ by 1¾ inches. Small beams ⅝ by 1½ inches all to be covered with a 3/16-inch Haskelite veneer. If preferred two pieces of ¼-inch mahogany wth a batten seam on the center may be used. This should be screw fastened and finished flush. Covers are to be mounted on piano hinges with a 1¼-inch brass binder through the center

(Continued on page 106)

V3015 NOV

Designs by
JOHN L. HACKER





MOTOR BOATING'S BU

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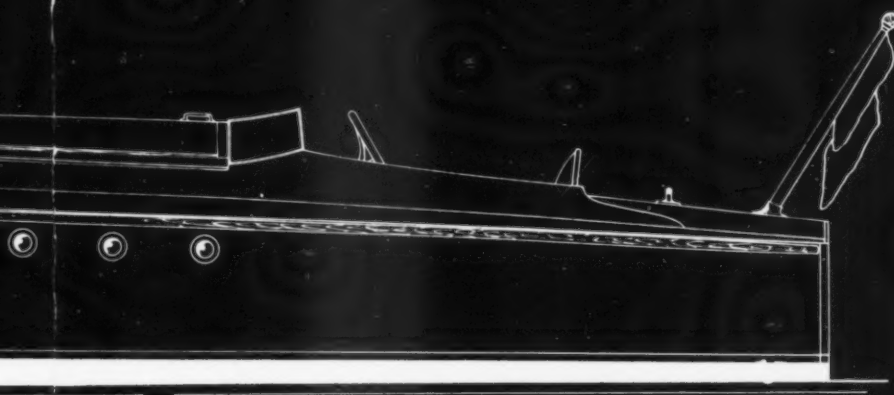

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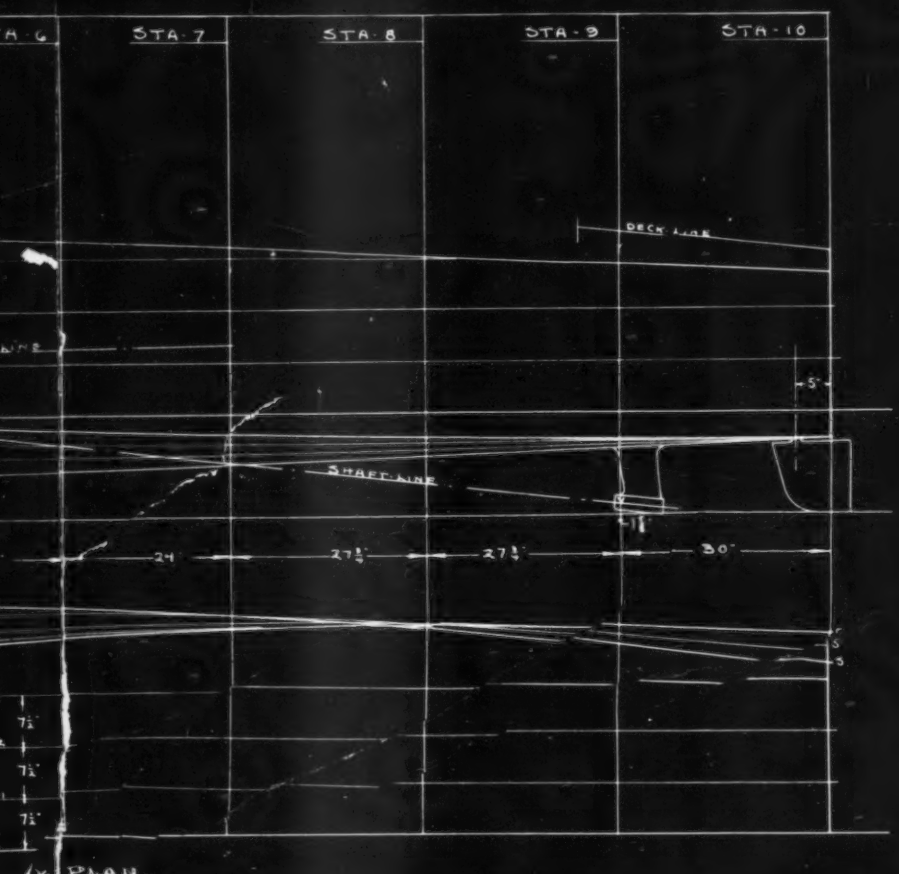

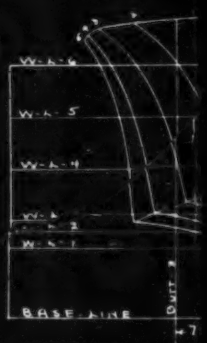

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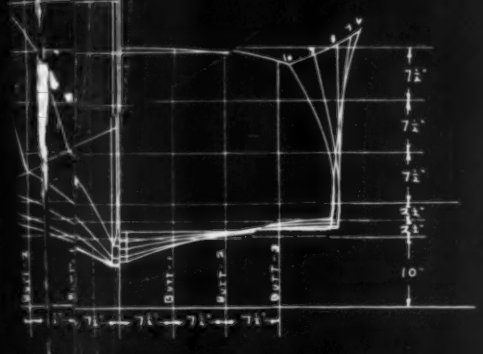

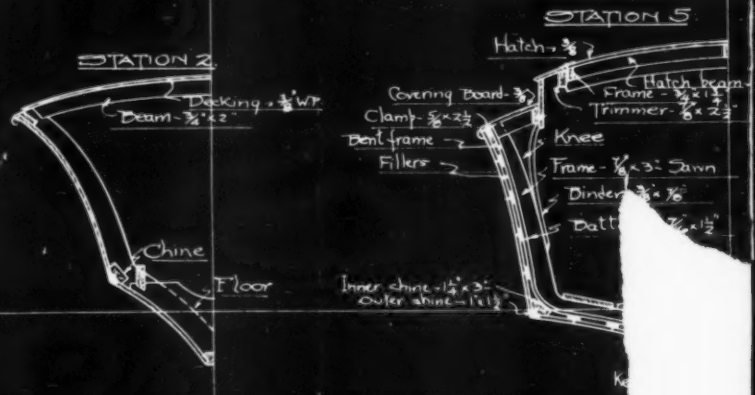

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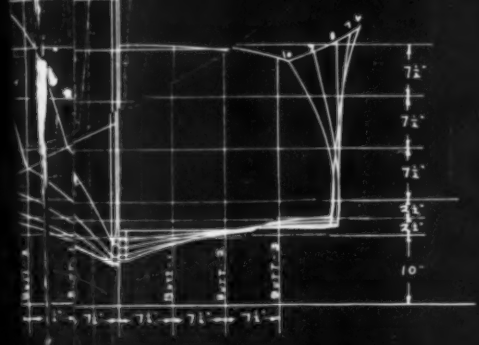
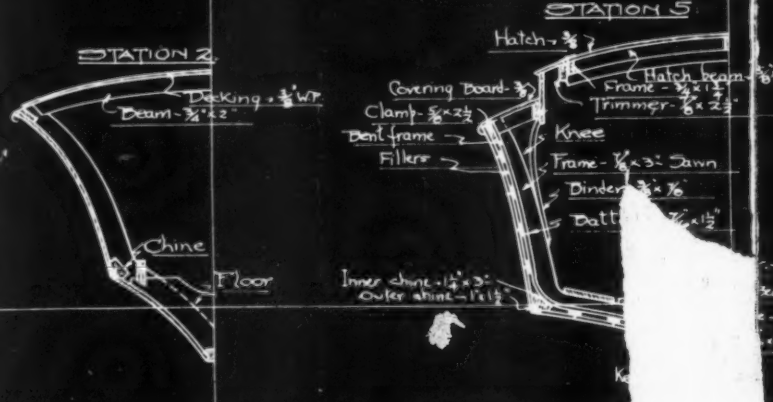
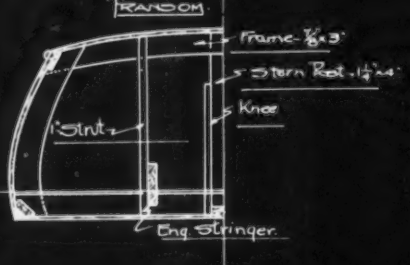




Scale
½" - 1'

STATION-7

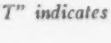


Questions and Answers on Lesson No. 8

The Chart

1. Q: What characteristics of the bottom are shown on charts?
   A: *Characteristics depend upon scale of chart to some extent. Characteristics shown include some or all of the following: Channels, contour curves, shoals, obstructions to navigation, quality of the bottom such as mud, sand, gravel, shells, pebbles, specks, clay, stones, coral; color of the bottom such as Black, White, Red, Yellow, Gray, Blue, dark, light, Green, Brown, consistency of the bottom such as hard, soft, fine, coarse, rocky, sticky, broken, large, small, steep, decayed, rotten, spreckled, flinty, gritty, ground, streaky, volcanic; wrecks, cables, eel grass.*
2. Q: What characteristics of the land are shown on charts?
   A: *Wharves, buildings, streets, conspicuous objects, ranges, outlines of shore and land, magnetic and true directions, cities and towns, latitude and longitude, variations of the compass, broken water, bridges, coast guard stations, dams, hills, bluffs, sand dunes, levee, marshes, woods. (Note—charts also show visibility of lights, buoys-type, number and color, aids to navigation, characteristics of aids to navigation, depths of water, ferries, dykes, tide rips, etc.)*
3. Q: Name the three methods of showing depths of water on a chart.
   A: *Fathoms, feet, feet and fathoms.*
4. Q: How would one know whether the figures on charts indicating depths mean fathoms, feet and fathoms or feet?
   A: *By referring to a note on the chart which always indicates how depths are shown.*
5. Q: Do figures printed on the clear portion of a chart always indicate depths or fathoms?
   A: *No.*
6. Q: Do figures printed on the shaded portions of charts always indicate depths in feet?
   A: *Refer to note on chart.*
7. Q: What is a ten fathom curve?
   A: *Is a line passing through all points having a depth of ten fathoms.*
8. Q: Do the figures shown on charts indicate depths at high or low water?
   A: *Mean low water.*
9. Q: Is the water ever shallower than indicated on the chart?
   A: *Yes.*
10. Q: How does one determine for any particular time and place whether the water is likely to be shallower than indicated on the chart?
    A: *By referring to the Tide Tables published by the U. S. Coast & Geodetic Survey.*
11. Q: Can a general coastwise chart be safely used for inshore navigation?
    A: *No.*
12. Q: Are all aids to navigation shown on all charts?
    A: *No.*
13. Q: How does one know whether there is published a chart of any particular locality?
    A: *By reference to chart catalogs published by the U. S. Coast and Geodetic Survey; the Corps of Engineers, War Department, U. S. Lake Survey, Mississippi River Commission; Hydrographic Office, Navy Department.*
14. Q: How does one know the number of the chart of a particular locality?
    A: *By reference to chart catalogs published by the U. S. Coast and Geodetic Survey; the Corps of Engineers, War Department, U. S. Lake Survey; Mississippi River Commission; Hydrographic Office, Navy Department.*
15. Q: How may one determine where to purchase charts?
    A: *By reference to the first issue of each month of the notice to Mariners or by application to the director of the U. S. Coast & Geodetic Survey, Washington, D. C.; or the Lake Survey, War Department, Old Customs House, Detroit, Michigan; Mississippi River Commission, St. Louis, Mo.; Hydrographic Office, Navy Department, Washington, D. C.*
16. Q: What branch of our Government publishes the charts of coastwise waters?
    A: *U. S. Coast & Geodetic Survey, Department of Commerce, Washington.*
17. Q: What branch of our Government publishes the charts of the Great Lakes and St. Lawrence River?
    A: *Corps of Engineers, Lake Survey.*
18. Q: What branch of our Government publishes charts of foreign waters?
    A: *Hydrographic Office, Navy Dept., Washington, D. C.*
19. Q: If the principal characteristics of a light are not given on a chart how does one determine same?
    A: *By reference to the light list published by the U. S. Coast and Geodetic Survey.*
20. Q: How should one determine the day appearance of a lighthouse shown on the chart?
    A: *By reference to the light list published by the U. S. Coast and Geodetic Survey.*
21. Q: What does the direction of an arrow shown on the chart indicate?
    A: *The direction of a current, tidal or otherwise.*
22. Q: What does an arrow with tail feathers indicate?
    A: *A flood current.*

Give the meaning of the following markings shown on the chart:

23. ..... 

23.A: *Life Saving Station. "T" indicates telegraphic connection.*

24. .....

24.A: *Light or lights of any kind.*

25. .....

25.A: *Light is on a small scale chart.*

26. .....

26.A: *Light vessel of any kind.*

27. .....

27.A: *Light vessel showing number of masts.*

28. .....

28.A: *A light with wireless.*

29. .....

29.A: *A light vessel with wireless.*

30. .....

30.A: *A light with a submarine bell.*

31. .....

31.A: *A light vessel with a submarine bell.*

32. .....

32.A: *Light with submarine bell and wireless.*

33. .....

33.A: *Light vessel with submarine bell and wireless.*

34. .....

34.A: *A lighted Beacon.*

35.

35.A: *An unlighted Beacon with characteristics indicated.*

36. .....

36.A: *Black Buoy.*

37 .....

37.A: *Obstruction Buoy with horizontal stripes.*

38. .....

38.A: *Channel buoy with Black and White vertical stripes.*

39. .....

39.A: *Checkered Buoy.*

40. .....

40.A: *Buoy with perch & square.*

41. .....

41.A: *Buoy with perch and ball.*

42. .....

42.A: *Whistling buoy.*

43. .....

43.A: *Bell buoy.*

44. .....

44.A: *Lighted buoy.*

45. .....

45.A: *Spindle or stake.*

46. .....

46.A: *Anchorage for large vessels.*

47. .....

47.A: *Anchorage for small vessels.*

48. .....

48.A: *Mooring buoy.*

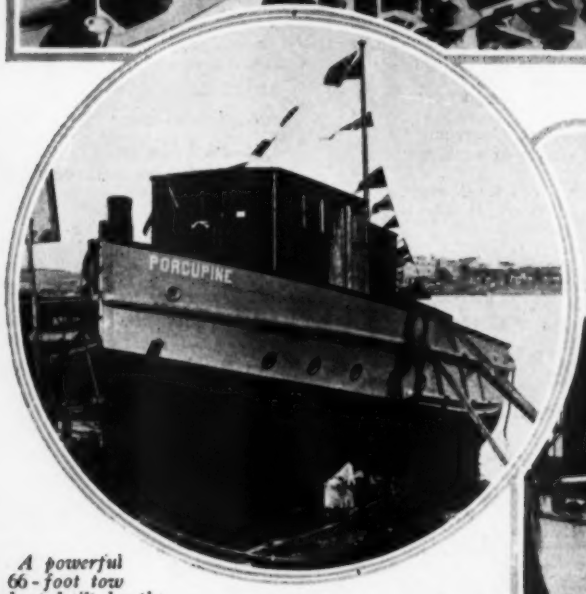
(Continued on page 51)

Motor Boats Their

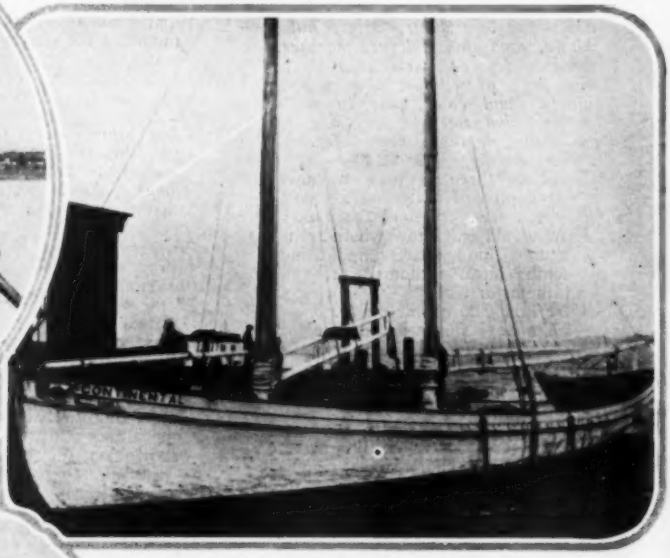
Toilers From Many Parts of Going at All Times to Earn

Many types and models of boats are used in the herring fishing, trawling, hand line, and lobster fishing craft during the entire year in Eastport, Maine harbor. They vary from 25 to 78 feet in length and many are of the canoe shaped type shown. These are equipped with small motors from 7½ to 10 h.p. which are found satisfactory for this service. The lobster industry is a very busy one during the short winter season

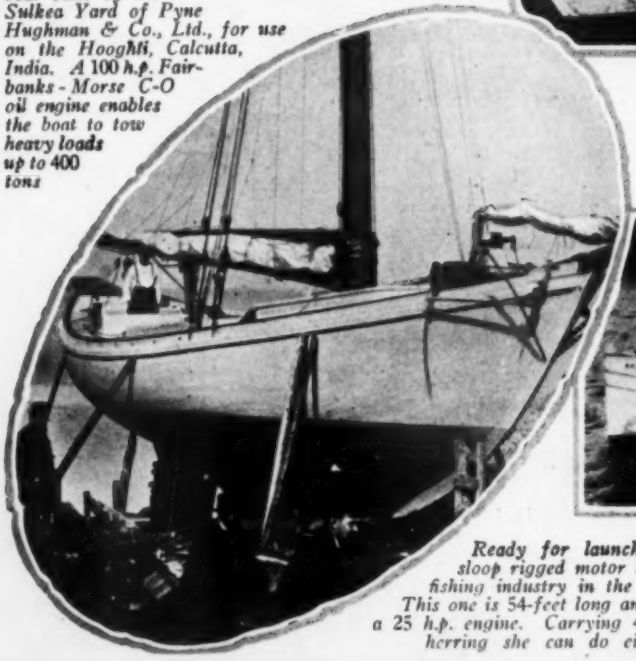
Photographs by F. G. Milliken and J. E. Murphy



A powerful 66-foot tow boat built by the Sulkea Yard of Pyne Hughman & Co., Ltd., for use on the Hooghli, Calcutta, India. A 100 h.p. Fairbanks-Morse C-O oil engine enables the boat to tow heavy loads up to 400 tons



Typical sardine carrying motor boat in daily use along the coast at Eastport, Maine. Continental is owned by the Sea Coast Canning Co. and forms one of a great fleet of fishing craft. She is 63-feet in length and equipped with a 50 h.p. Standard gasoline engine. Her capacity is 75 hogsheads of herring



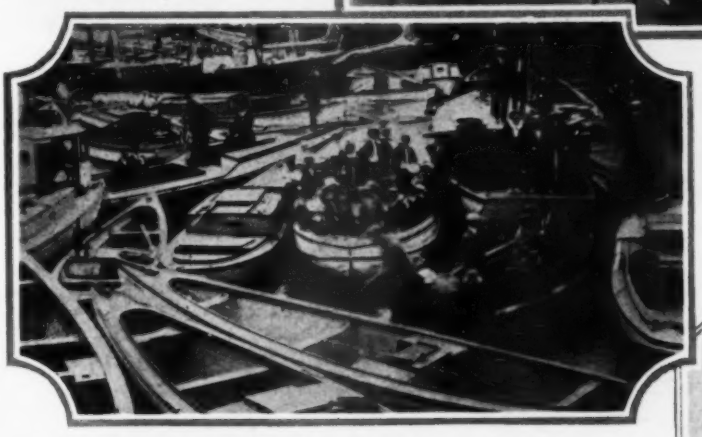
***Ready for launching** the typical sloop rigged motor boat used in the fishing industry in the Bay of Fundy. This one is 54-feet long and equipped with a 25 h.p. engine. Carrying 40 hogsheads of herring she can do eight knots*

Del Rey II built for year round fishing service by Charles Butson at Groton, Conn. for E. V. Taber. While only 38-feet long her 32 h.p. Palmer motor drives her at 10 miles. She is an unusually heavy craft and delivers her fares directly to the New York market

Which Work Way

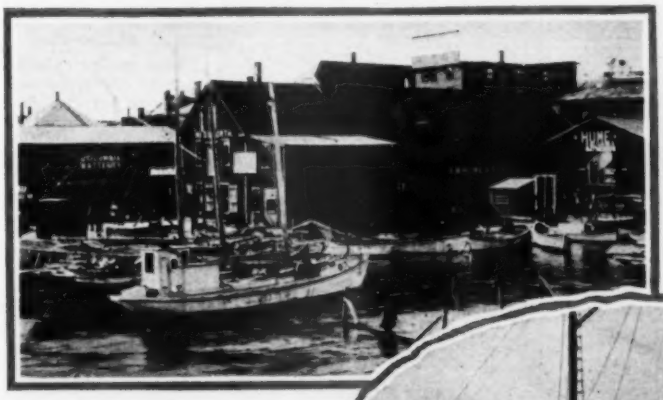
the World Who Must Keep Their Daily Ration of Fuel

Uncle Sam's farthest eastern sea port on the Maine Coast. Canada is in the distance. It is the center of the sardine canning industry and 56 canneries are operating in the busy season. Eastport is often called the jumping off place of the U. S. since one can go no further in Maine by land

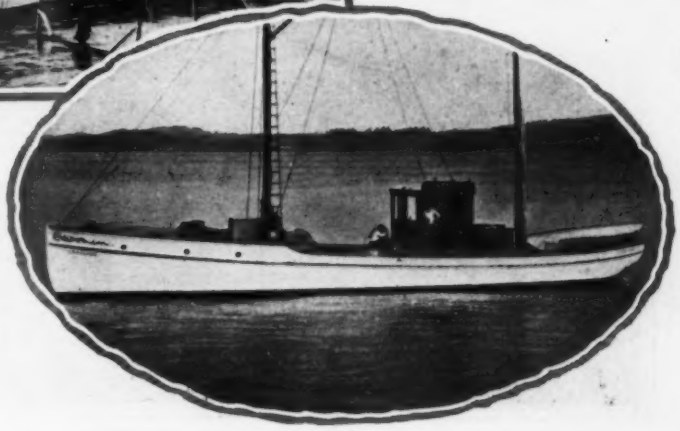


Canadian and Yankee motor boats of Passamaquoddy Bay. Daily supplies of herring are brought in to the canneries and during the packing season nearly 1,000 craft of all types make this their headquarters. From 800 to 1,000 hogsheads of sardines are handled daily

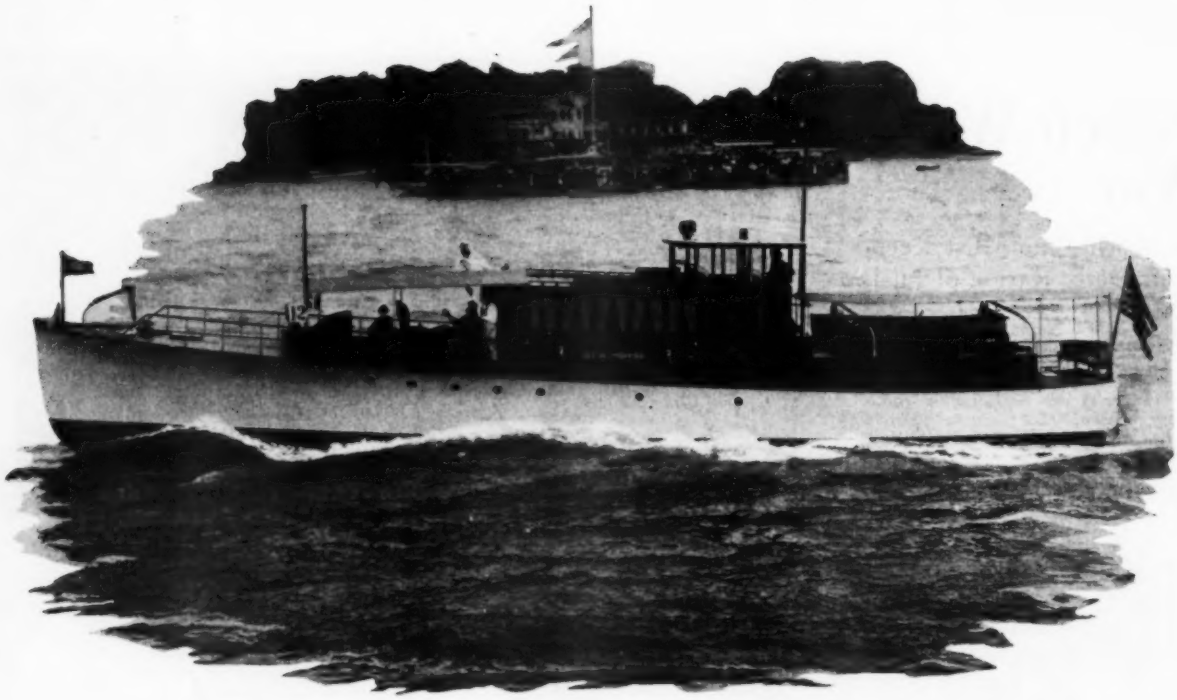
Lois Evelyn typical of the fishing boats developed for Long Island Sound. She is 32-feet in length and powered with a 3 cylinder 21 h. p. Lathrop motor. Her principal occupation will be lobstering and drag netting in the vicinity of Groton, Conn.



Many of the fishing craft used in the sardine industry in Passamaquoddy Bay are Canadian owned and are valued at from $10,000 to $15,000. Eastport, Maine is the natural shopping center at which they replenish their supplies. They bring in from 50 to 70 hogsheads of herring each trip



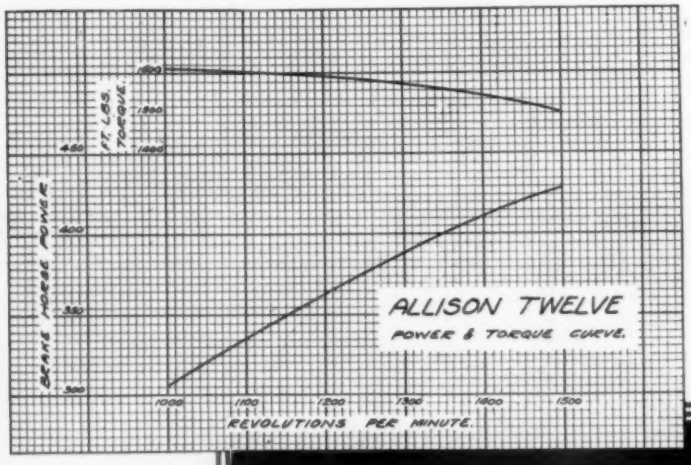
Grayling, one of the recent additions to the fleet of sardine fishers of the Sea Coast Canning Co. This new craft was built at East Booth Bay, Maine and is 65-feet in length. Her power plant is a 50 h. p. Sterling gasoline engine supplemented by auxiliary machinery for hoists and electricity



Sea Horse, a twin screw express cruiser, one of the first boats to be equipped with the Allison 12-cylinder V-type motor. She was built and designed by the Purdy Boat Co. for James A. Allison and is 80-feet in length. The two motors which power her are able to drive her at better than 20 m. p. h. Sea Horse made the run from the Great Lakes to Florida under her own power and successfully competed in the long distance races there during the winter

Building Marine Motors in a Large Plant

An Idea of the Vast Amount of Plant and Machinery Required for the Modern Production Methods of Building the Allison Twelve Cylinder Marine Motors



The horse-power of the Allison twelve cylinder motor increases uniformly with the revolution rate. The torque curve is quite flat and does not vary appreciably as the speed of the motor changes. This permits of the maximum effort of the machine at any rate of speed at which it may be run. The power developed is unusually high in proportion to the weight of the machine. On a displacement of 2,138 cubic inches and a weight of about 4,400 lbs. a maximum of 450 h. p. is developed

The offices and factory buildings of the Allison Engineering Company at Indianapolis, Ind., represent the most modern construction in buildings of this nature. They are closely grouped so that all departments can readily communicate with one another eliminating all lost motion in the necessary intercourse

Interior of the small parts shop where such items as screws, bolts, and nuts as well as other small fittings for the Allison motors are produced in large quantities on automatic machinery. The shops, as can be seen, are well lighted, with spacious aisles giving all employees sufficient floor space

The assembling floor where the motors are finally assembled and carefully inspected and tested prior to shipping. Due to the generous size of the parts for these machines, ample floor space is essential. The crank shaft for example is a 3½-inch forging with seven generous bearings

Another corner of the machine shop showing a few of the many individual motor driven machines of the latest type for producing accurate work on Allison engine parts. There are vertical boring mills with all modern improvements as well as lathes and milling machines in large numbers.

Great Circle Sailing

Finding the Great Circle Course and Distance By Computation, Including Remarks on Composite Sailing—The Ninth Lesson of a Correspondence Course Which Will Be a Complete Treatise on the Subject of Dead Reckoning

By Dean Potter

Chairman, Committee on Instruction, United States Power Squadrons, Inc.

IN the last lesson, the use of the gnomonic chart was discussed, and a method of finding the *initial* great circle course by inspection, from the azimuth table, was explained. The problem of finding the *final* course is a similar one, except that it proceeds in the opposite direction. That is, the course is found as if we were starting from the point of destination and going toward the point of departure. Destination is treated as L^1 and departure as L^2. We go into the azimuth table with the latitude of destination, and go into the declination column with the latitude of departure. The difference of longitude, of course, is the same in either case.

Some one may ask, "How do you find the *intermediate* courses?" These are found precisely as the initial course is found, except that the process starts from the latitude and longitude of the place to which the vessel has been carried by the preceding course. Thus, the first leg of the great circle might take us say 200 miles from the place of departure, and into a new latitude and longitude. This new position becomes the starting point for finding the next course, and so on.

While, in practice, chart and inspection methods are generally preferred, the navigator should familiarize himself with computation methods, for the same reasons which impel a study of those methods in solving other dead reckoning problems. Indeed, there is a special reason for learning how to compute the great circle distance, namely, that computation, especially by the cosine-haversine formula, is the easiest method, so far as the writer is informed, by which the distance can be found. Those familiar with nautical astronomy will at once recognize the formula hereinafter given as an adaptation of the cosine-haversine formula employed in the Saint Hilaire method. (Bowditch, page 157, 159). It is the same in essence, but with new names for the elements employed. Thus one formula not only fills the bill for all the time sights required by the navigator, but solves great circle distance as well.

Computation: A great circle is a part of a spherical triangle, and the great circle problem is solved by spherical trigonometry. It is the one case in dead reckoning where plane trigonometry affords no solution. But this does not necessitate our including a course in spherical trigonometry in these lessons. A spherical triangle is solved by the same logarithms and trigonometrical functions, heretofore used in these lessons. Mathematicians have prepared the necessary formula and we need not derive them. It would be beyond the scope of these lessons to enter that field, and it is quite unnecessary that we should do so. We have but to take the formula and follow directions.

As a matter of fact, it is rare indeed, in actual practice, that great circle sailing is worked by computation. The graphic and tabular methods, above described, are sufficiently accurate, and immensely preferable, on the ground of expedition and simplicity; and computation would scarcely ever be resorted to, if charts and tables were available, save possibly to find the great circle distance.

The haversine formula. The Bowditch method of computation is precise and complete. But in the writer's experience, many students have found it difficult. He deems the haversine formula preferable for finding the distance and course. It does not give the vertex, or point of highest latitude of the great circle, nor the latitude and longitude of intermediate points along the track. But a computation of the vertex seems hardly necessary in any actual case. It often happens that the vertex of the great circle does not lie between the places of departure and destination. It may be at a remote distance from either, as in the illustrative example given in Bowditch, p. 81-82. Nor is it deemed necessary, for practical purposes to compute the highest latitude, of the portion of the track connecting the two places. If a gnomonic chart be available, this highest latitude may be at once known, by simply looking along the edge of the parallel rules placed to cut the track from port to port. If there be no gnomonic chart, the plotting of a few great circle courses on the sailing chart, would soon indicate whether the track would run into extreme latitudes. Thus, a computation method which gives great circle course and distance seems adequate for our requirements. The haversine formula commends itself for these purposes. By it the distance may be found more quickly, and as an independent solution, without first computing the course, as in the Bowditch method. This is important, for ordinarily computation would be desirable only to find the distance, the course being taken from chart or tables. Again, in the Bowditch method, strict regard must be given to the signs of the quantities. Bothersome positive and negative signs must be applied and carried throughout, introducing elements of algebraic addition and subtraction, which a seaman might wish to avoid. In the haversine formula, these signs are handled by a simple and universal rule. We shall, therefore, confine ourselves to the haversine formula. If the student wishes, in addition, to go joy riding into the Bowditch method, it will do him no harm, and we shall admire his diligence and if he wishes to study methods for computing all intermediate points along the great circle track, we would refer him to the excellent chapter in Norie's Epitome and Dunraven's navigation covering these subjects.

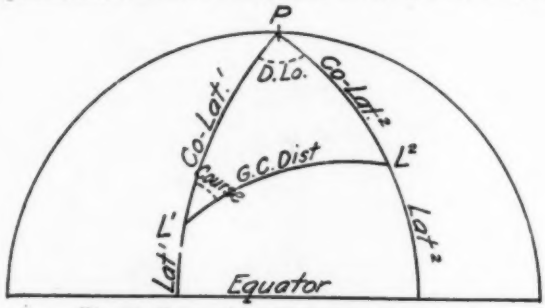


Fig. 36 Illustrating the great circle triangle

Fig. 36 illustrates a typical great circle triangle. L^1 is the port left, L^2 the port of destination. P is the pole. The arc between the meridians PL^1 and PL^2 is the Diff. of Long. From the equator to L^1 is the latitude, which we shall call Lat.¹. The latitude of L^2, we shall call Lat.². From L^1 to the Pole is the co-latitude (complement of the latitude) of L^1, which we shall call Co-Lat¹ and the Co-latitude of L^2 we shall name Co-Lat.². The co-latitude is 90° minus the latitude. If the port of destination (L^2) be on the opposite side of the equator from the ship, then Co-Lat² is 90° plus the latitude. The great circle initial course, and the distance are also shown.

The formulae are as follows:

1. For the distance:
   hav θ = hav D Long. cos Lat.¹ cos Lat.²
   hav Dist = hav θ + hav (Lat.¹ ~ Lat.²)
2. For the initial course:
   hav θ = hav Co-Lat.² — hav (Dist ~ Co Lat.¹)
   hav Course = cosec Co-Lat.¹ cosec Dist hav θ

Note. θ is the Greek letter theta used to represent a so-called auxiliary angle which comes into the computation. The sign ~ means the difference between the two quantities, the less taken from the greater. North latitudes are marked +, and south latitudes —. If the latitudes are of

the same name, as both north or both south, the ~ is found by simply subtracting the less from the greater. If they are of different names, one + and the other —, then ~ is found by adding them, precisely as we get the difference of latitude between two places, when one is north and the other south of the equator. This is the only respect in which plus and minus signs need be considered, when working great circles by the haversine formulae. (See explanation of haversine table following problem.)

For those desiring a rule, we submit:

Rule to find the great circle Distance: To the log. hav. of the D Lo. add the log. cosines of the Lat.[1] and Lat.[2]; the result is the log. hav. Θ.

To the nat. hav. Θ add the nat. hav. of the difference between Lat.[1] and Lat.[2] and reject 20 from the index; and the result is the nat. hav. of the great circle Dist.

Rule to find the great circle Course:

From the nat. hav. of the Co-Lat.[2], subtract the nat. hav. of the difference between Co-Lat.[1] and the great circle Dist.; the result is the nat. hav. Θ.

Then add together the log. cosec of the Co-Lat.[1] and the log. cosec. of the great circle Dist., and the log. hav. Θ, and reject 20 from the index; the result is the log. hav. of the great circle Course, always reckoned from the pole nearest the Lat.[1].

(These rules are adapted from the rules and formula of J. W. Saul, editor of Norie's epitome.)

To work a problem by the haversine formula, we have:

Example.—From Barbados (S Point Lighthouse) to St. Helena Island. Find great circle distance and initial Course, by haversine formula.

Bowditch p. 295 Barbados,
Lat. 13° 02′ 45″ N, Long. 59° 31′ 50″ W
Bowditch p. 303 St. Helena,
Lat. 15° 55′ 00″ S, Long. 5° 43′ 03″ W
D Lo. 53° 48′ 47″

The great circle distance:

D Lo. (53° 49′)	log. hav.	9.31136
Lat.[1] (+13° 03′)	log. cos.	9.98864
Lat.[2] (—15° 55′)	log. cos.	9.98302
	log. hav.Θ	9.28302
	nat. hav.Θ	.19188
Lat.[1] ~Lat.[2] (28° 58′)	nat. hav.	.06255
Dist. (60° 35′)	nat. hav.	.25443

=3635 nautical miles

The initial Course:

	90°			90°	
	13° 03′ N			15° 55′ S	
Co. Lat.[1]	76° 57′	Co. Lat.[2]		105° 55′	
Co. Lat.[2]	(105° 55′)	nat. hav.	0.63712		
Co. Lat.[1]	(76° 57′)			log. cosec. [1]0.01136	
Dist.	(60° 35′)			log. cosec. 10.05995	
Dist. ~ Co. Lat.[1]	(16° 22′)	nat. hav.	0.02026		
		nat. hav. Θ	0.61686	log. hav.	9.79019
Initial Course	(117°)			log. hav.	9.86150
	Or S 63° E				

Note: In the first part, the log. hav.Θ having been found, turn to Table 45 and opposite the log. hav. find the corresponding nat. hav. This nat. hav. is added to the nat. hav. of $L^1 \sim L^2$, giving the nat. hav. of the Dist.

In the second part, the nat. hav. of Dist. ~ Co. Lat.[1] is subtracted from the nat. hav. of Co. Lat.[2] giving the nat. hav.Θ. Then the nat. hav.Θ is turned into the log. hav. and added to the log. cosecs. above, giving the log. hav. of the Course.

It is important to distinguish between natural and log. functions as here used. Naturals cannot be added to or subtracted from logs. The addition of logs gives a product. It multiplies. The addition of naturals gives merely their sum.

The Haversine Table. (Bowditch table 45, p. 817 *et seq.*) In this table, the log. and natural haversines are arranged in parallel columns. At the top of each set of columns, appears the value in both time and arc. Thus, p. 835, left-hand column, at the top we read "2h 0m 30° 0′," meaning that the haversine at the top of the column stands for either 30° of arc, or, what is the same thing, 2 h 0m of time, 15° of arc equalling 1h of time. The haversines for seconds of time appear opposite the italic figures at the extreme left of the page. Thus, for 2h 0m 13s, run down the extreme left hand column to 13, and opposite read log. hav. 8.82752, and nat. hav. .06722, the logs. being in light face type and the naturals in heavy face type. The heavy face figures at the left of the page, 1′, 2′, 3′, 4′, etc., stand for minutes of arc. Thus, if we want 30° 3′, we run down the left hand column to 3′, and opposite it read log. hav. 8.82741, nat. hav. .06721. At the left of the 3′ is a blank, but this blank comes between 11s and 13s, and plainly is the place where 12s would go, were it not omitted to avoid crowding in the printing. Note that between each minute of arc, four functions are printed, with seconds (time) opposite them, but with no expressed arc values. But 1′ (arc) = 4s (time), so plainly each of the four functions between the minute (arc) divisions stand for 15″ of arc. The first one after each minute equals 15″, the second 30″ and the third 45″, etc. Thus, if we desired the hav. of 30° 3′ 15″, run down to 3′, and take the next one below it, the log. hav. being 8.82752. This stands for either 2h 0m 13s of time, or 30° 3′ 15″ of arc. The table is gotten up so as to show time down to single seconds. But arc is given only down to 15″.

Examples for practice. Compute the great circle distances and courses of the problems given in lesson No. 8, October MoToR BoatinG, page 118, Examples Nos. 57-60.

Composite Sailing

Composite Sailing requires but brief comment. It is sometimes impossible or impracticable to sail a true great circle between two places. The track may lead into extreme latitudes, or dangerous waters, or across the land. It may go too far beyond the beaten paths, and even a mariner likes company. In such cases a limiting parallel may be chosen, and the great circle sailed until such parallel is reached; and, then a rhumb course along the parallel to a point where the great circle may again be taken up. The method of thus combining great circle and rhumb course is called Composite Sailing.

With a gnomonic chart at hand, it is merely necessary to run the eye along the edge of the parallel rules, placed from port to port, to see if the great circle would carry the ship into unhappy places. If so, a safe limiting parallel should be decided upon, and the voyage planned accordingly. In default of a gnomonic chart, a few great circle courses might be ascertained and plotted upon a sailing chart, and it would soon be apparent if the great circle went beyond the limits of safety or convenience.

Composite sailing requires no new methods, but merely combined methods already studied.

Questions on Lesson No. 8. Great Circle Sailing

1. Define great circle?
2. What is Great Circle Sailing?
3. What are its advantages?
4. What is a gnomonic chart? Where is its distortion (a) least (b) greatest?
5. By what kind of a line is a great circle represented (a) on a gnomonic chart, (b) on a Mercator chart?
6. Under what conditions may Great Circle Sailing be of special advantage to sailing ships? Explain.
7. Can a great circle be followed precisely? Explain.
8. What method may be adopted to enable the mariner to follow the great circle approximately?
9. After the great circle course has been determined, what precautions should be taken before attempting to sail it? Why?
10. From Lat. 38° 05′ N, Long. 172° 19′ E, to Lat. 4° 57′ S, Long. 152° 21′ W. Find the initial great circle course by azimuth table.

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Historical Pageant On Lake Champlain

The shores of Lake Champlain promise to witness one of the largest spectacles which have ever been staged on any body of water anywhere. The project is to bring many visitors to the Champlain Valley during the summer of 1923 and due to the exceptional boating facilities it is anticipated that yachtsmen from all parts of the country will cruise to the lakes and take part in this pageant. Communities on both sides of the lake are already actively at work on plans for next summer and a permanent organization to conduct the event will be organized with headquarters in New York. It is planned to stage a large number of motor boat races and other events and Yachting, Motorboating, and similar associations are being invited to compete in the various events.

New Cruiser for New Orleans

William Fetterly & Sons, New Orleans boat builders, have just completed a handsome new cruiser for Alfred J. Krower, prominent local wholesale jeweler. Her owner has named her Kismet. She is 55-feet long by 10-feet beam and is equipped with a pair of six cylinder 145 horse-power Sterling engines. On her trial trip she developed 25 m.p.h. and is a fine acquisition to the large fleet of the Southern Yacht Club.

Shops Change Hands

The Yachting Machine Shops, located at West End on Lake Pontchartrain, which was formerly owned by Gordon S. Orme, were recently purchased by Milton R. Fetterly, Emil Porkert and C. D. Burrell, who will conduct the business at the same location under the name of the West End Marine Iron Works. All of the above gentlemen are men of ability in the marine line and should make a success of this business.

A Reduction in Motor Prices

The light weight outboard motor which is manufactured by the Spinaway Boat Motor Co. of Freeport, Ill. has been reduced in price. Due to the increased production made possible by the revision in manufacturing costs, it has been possible to bring down the price of the machine, without

A little V-bottom tender powered with a 9-12 horse-power Universal motor recently designed by William H. Hand, Jr. as a tender for the converted submarine chaser North Star. Her dimensions are 18-feet in length by 5½-feet beam and in this size she can carry twelve people easily

Keyport Y. C. Rac

Jersey Flyer Wins Speed Bo
I. M. Upperco's "Cadillac
All Trophy and Is Crowned Fas

EVER since the time old man Noah turned his attention to parking the Ark in out of the wet, the mariner has run his never-ending race with the elements as his strongest rivals. The day that Commodore Hetherington had picked out for the final races to be held at the Keyport Y. C., Sept. 4th, thinking to himself of the sport to come, the god who operates the rain spigots and wind machine on high chuckled, and, unbeknownst to the Commodore, slyly slipped in a couple of entry blanks bearing the names of Wind and Rain.

When the big and little speed boats from all the clubs belonging to the Raritan Bay Yacht Racing Association lined up for the start on Monday afternoon, Wind and Rain were right among them, and gave the racers the struggle of their lives to complete the regatta. But the committee who had the final race in charge was undaunted and the men who operated the boats were fearless and therefore the races were held promptly as scheduled, right to the minute, with a large entry list.

At 12:15 the Bang-and-Go-Back race was started with an entry of 12 boats and was won by Isaacrrr, Gidney, Keyport

Keyport Stages Successfu

Jersey Flyer wins Speed Boat Trophy—Carlson Speed Trophy goe
Cadillac—Proal gives the spectators a thrill

EVER since the time old man Noah turned his attention to parking the Ark in out of the wet, the mariner has run his never-ending race with the elements as his strongest rivals. The day Commodore Hetherington had picked out for the final races to be held at the Keyport Yacht club, Sept. 4, thinking to himself of the sport to come, the god who operates the rain spigots and wind machine on high chuckled, and unbeknownst to the commodore slyly slipped in a couple of entry blanks bearing the names of Wind and Rain.

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At 12:15 the Bang-and-Go-Back race was started with an entry of 12 boats and was won by Isaacrrr, Gidney, Keyport

Mid-West

By Vera Thomas Griffith

EVER since the time old man Noah took a squint at his home-made barometer and turned his attention to parking the Ark somewhere in out of the wet, Man The Mariner has run a never-ending race with which he has had the elements as his strongest rivals.

The day that Commodore Sheldon Clark completed the entry list for the Pageant of Progress races at Chicago, August 3 to 6, and smiled to himself thinking of the sport to come, the god who operates the rain spigots and the wind machines on high chuckled and unbeknownst to the commodore, slyly slipped in a couple of entry blanks bearing the names of the weather twins, Wind and Wave.

And when the big and little speed boats from all parts of the mid-west lined up for a start Thursday afternoon, August 3, Wind and Wave were right among 'em and gave the water racers the struggle of their lives for the three days scheduled for the regatta and two additional days. Friday afternoon, the early part of Sunday afternoon, when a rain squall passed over, and Monday afternoon the elements were victorious and drove the doughty little speedsters to cover on the pier; but Thursday afternoon, Saturday afternoon and the latter part of Sunday afternoon when Wind almost died, the boats rode right over Wave.

The interesting style of MoToR BoatinG's writers in reporting the races at Chicago has proven so popular that our contemporary magazines have used the identical style in their most recent issues. The adjoining cut shows in the upper portion these pages together with the page from the September issue of MoTor BoatinG below which contained the original story

in any way lowering the standards of quality under which it is being built. The motor is readily portable and is provided with a safety tilting feature which enables the boat to pass over hidden obstructions.

An Improved Battery

The popular type Columbia Hot Shot battery in four cell size and six volts capacity is now being marketed with a new steel container. This is a great improvement over the old type fibre container which it replaces. It is constructed to withstand the roughest service and is unaffected by exposure to the weather. The insulation is so arranged to prevent internal short circuits and the rugged case assures full measure of service and long life. A new type woven fabric handle has been applied for strength and convenience in carrying. The improved battery will be sold at the same price as the older type. All other standard sizes of Hot Shot batteries will be mounted in similar steel cases as fast as posible.

High Pressure Pumping Unit

A novel little portable high pressure pump has just been developed by the Evinrude Motor Company and is particularly adapted for fire fighting at points remote from other sources of fire protection. This litttle pump is directly coupled to a two cylinder Evinrude engine of 4-5 horse-power and is capable of delivering 1,500 gallons of water through 1 1/3 miles of 1½-inch pipes. Or again it will throw a stream at 120 pounds pressure through a ⅜-inch nozzle to a height of 100 feet. This little unit has been tested in the Forest Fire Protection Service of the Canadian Government and has met every condition which could be imposed upon it by the officials conducting the tests. The unit is portable and readily moved about by two men. It can be quickly set up and placed in service and is a fire fighting unit of exceptional value. It will handle any non-corrosive fluids at slow or high speeds and for either low or high pressure work. It should prove to be a most valuable set for bilge pumping or similar service where this capacity is needed.

(Continued on page 52)

The new Columbia Hot Shot Battery which is being enclosed in a steel container is weather proof and at the same time completely insulated electrically

"Lea"—the Biggest Point Winner for the British-American Cup

TWO firsts to "Lea" in the International Six-Meter Trophy races—each "win" under different weather conditions.

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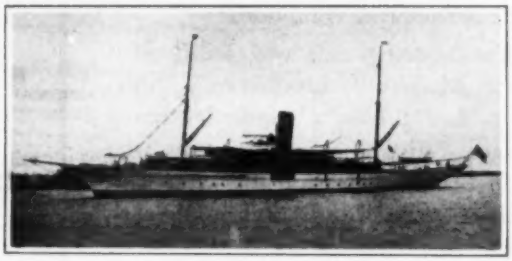
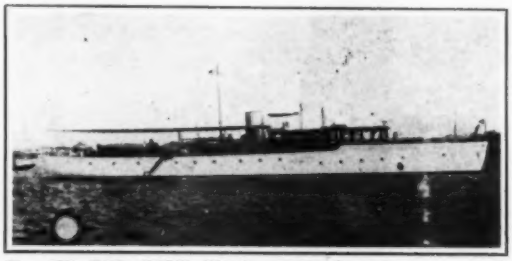
Complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



No. 341—For Sale or Charter—Large, sea-going steam yacht. Palatial accommodation. Unusual opportunity. Several similar and smaller available craft. Cox & Stevens, 25 Broadway, New York.



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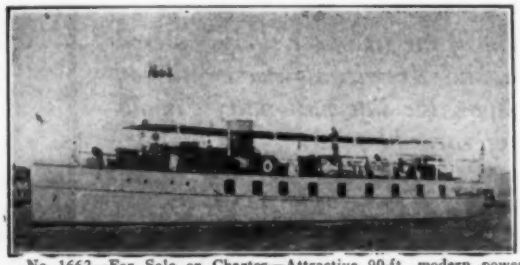
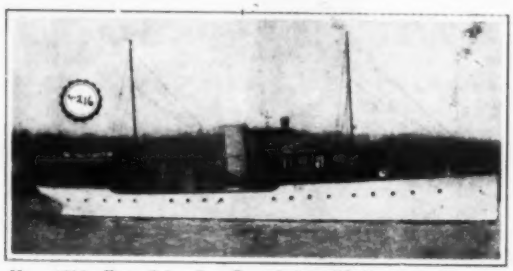
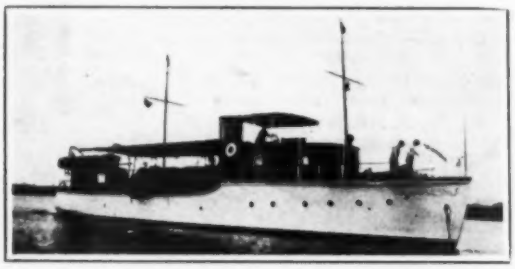


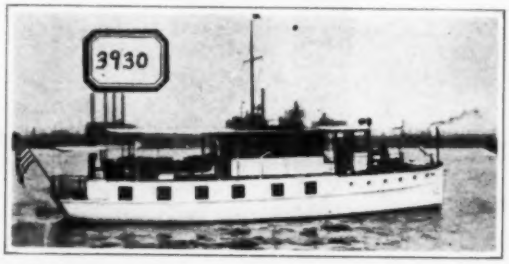
No 1662—For Sale or Charter—Attractive 90-ft. modern power houseboat. All the comforts of a country home. Large saloon, four staterooms, two bathrooms, handsomely furnished. Cox & Stevens, 25 Broadway, New York.



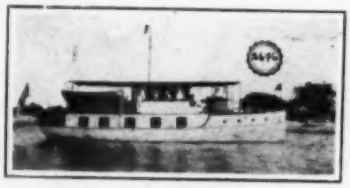
No. 4216—For Sale—In Commission—Modern 95 ft. twin screw motor yacht. Speed 12-14 miles. All conveniences. Deck dining and main saloons; four staterooms. Large deck space. Cox & Stevens, 25 Broadway, New York.



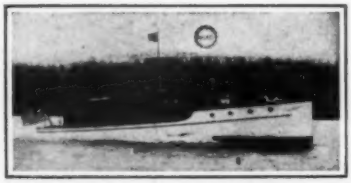
No. 3064—For Sale—Twin-screw Semi-houseboat cruiser; 80'x16'x3'2" draft. Speed 11-12 miles. Deck dining saloon, 4 double staterooms, 2 baths and toilet rooms. Large available deck space. Cox & Stevens, 25 Broadway, New York.



No. 3930—For Sale or charter—Recently built motor houseboat; 61 x 16 x 3 ft. In commission. Speed 10 miles; 6 cyl. Standard motor. Large deck saloon, three staterooms, bathroom, etc. Excellent opportunity. Cox & Stevens, 25 Broadway, New York.



No. 2646—For Sale—Attractive 52 ft. power houseboat. Standard motor. Speed 10 miles. Deck dining saloon, double and single stateroom, toilet room and shower. Price reasonable. Cox & Stevens, 25 Broadway, New York.



No. 4050—For Sale—High class fast 52 ft. twin-screw enclosed bridge deck cruiser. Speed up to 30 miles; two cyl. 200 H. P. Speedway motors. Double stateroom, saloon with two pullman berths, toilet room, galley, etc. In commission. Cox & Stevens, 25 Broadway, New York.

No. 3944—For Sale or Charter—Practically new, twin screw 60 ft. bridge deck cruiser. Best craft of type and size available. Saloon, double stateroom, bathroom, etc. In Commission. Cox & Stevens, 25 Broadway, New York.

PLANS, PHOTOGRAPHS AND PRICES ON REQUEST.

Advertising Index will be found on page 110

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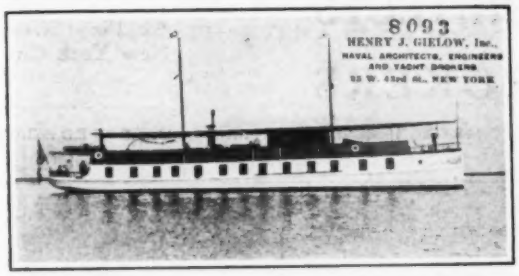
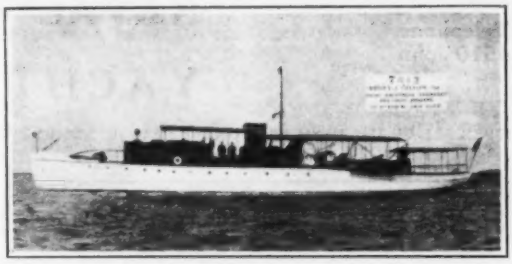
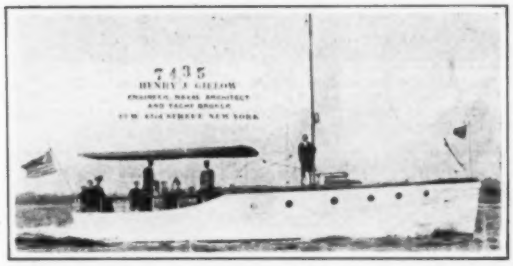


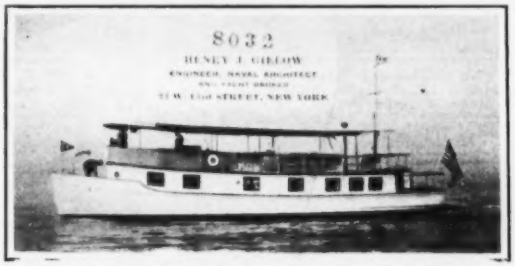
No. 8093—For Sale or Charter—Desirable 95 ft. twin screw power houseboat. Standard motors. Large saloon, three double staterooms, two bathrooms, and deck lounging saloon. Suitable for Northern and Southern cruising. Now in full commission. Henry J. Gielow, Inc., 25 West 43rd St., New York City.



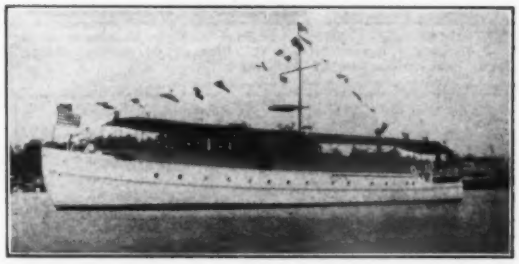
No. 7013—ForSale—Opportunity to buy twin-screw Diesel motor yacht reasonable. Delivery Sept. 1. 110 x 18 x 6 ft. 6 in. Copper sheathed. 3 large, airy staterooms, each with separate toilet room, one bath. Completely found, electric fans and fully screened. Able sea boat has twice cruised West Indies. Fuel cost sixty cents per hour at 10 knots. All overhauled 1922. H. J. Gielow, Inc., 25 West 43rd St., New York City.



No. 7435—For Sale—Very attractive raised deck cruiser, 40 ft. x 10 ft. x 3 ft. 6 in. Speed 10 miles. 20th Century motor. Double stateroom, large saloon, galley, toilet room, etc. All in first class condition. Henry J. Gielow, Inc., 25 West 43rd St., New York City.

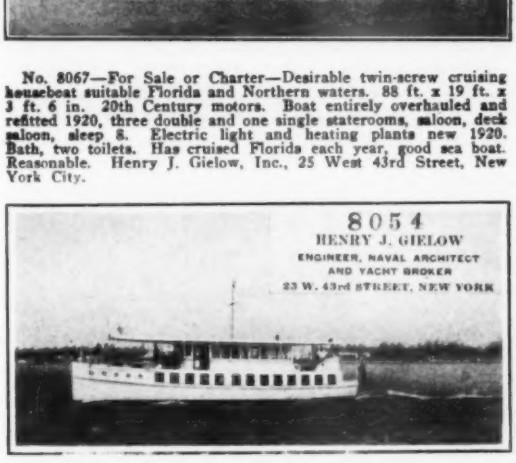


No. 8032—For Sale or Charter most desirable 60-foot houseboat for Southern cruising. Large saloon, three double staterooms, bathroom. Exceptional large deck space. All in first class condition throughout. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.



No. 8067—For Sale or Charter—Desirable twin-screw cruising houseboat suitable Florida and Northern waters. 88 ft. x 19 ft. x 3 ft. 6 in. 20th Century motors. Boat entirely overhauled and refitted 1920, three double and one single staterooms, saloon, deck saloon, sleep 8. Electric light and heating plants new 1920. Bath, two toilets. Has cruised Florida each year, good sea boat. Reasonable. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

No. 8177—For Sale—New houseboat cruiser completed spring delivery. 48 ft. x 13 ft. 6 in. x 3 ft. One double, one single stateroom, large saloon with two berths and deck saloon 12 ft. x 8 ft., sleeps six. Crew stateroom forward. Heavy construction, finished mahogany and cream enameled. Delco lighting plant. 40-50 H.P. 20th Century engine. All best workmanship. Speed 9-10 miles. Popular type for Florida and Northern cruising. Price reasonable based on present reduced building cost. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.



No. 8054—For Florida Charter—Desirable 66-foot Cruising Houseboat. Large saloon, one double and four single staterooms, bathroom. Large deck saloon. Now in Southern waters. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

No. 8077—For Sale—Desirable cruising houseboat all in fine condition. Thoroughly overhauled 1921. Inspectable New York. 75 ft. x 16 ft. x 3 ft. 6 in. Winton motor, 6 cylinder 70 H.P. Three large staterooms, large deck saloon; newly furnished, screened throughout. Heavily built, able sea boat. Speed 10-11 miles. Price attractive. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

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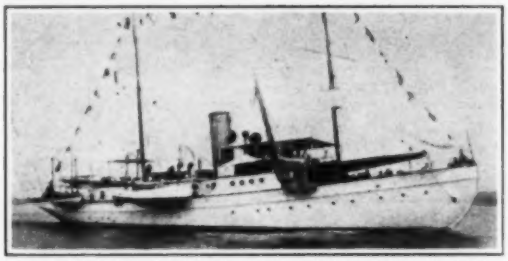
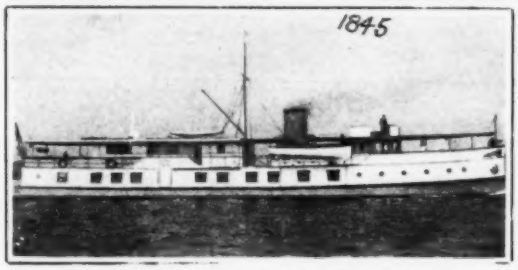
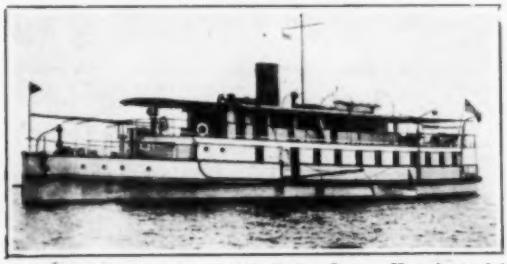


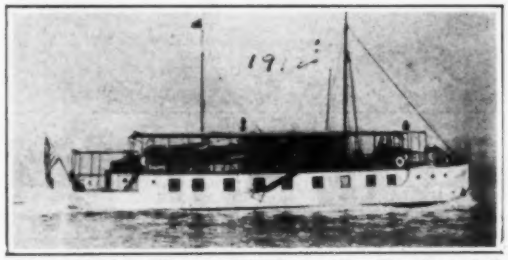
No. 26E—Sale—Ocean going steam yacht— 158' x 127' 7" x 24.8' x 12' 9" draft. Built 1913. Commodious owner's accomodations—Completely and thoroughly overhauled, refitted and refurnshed under our supervison in Fall 1920.



No. 1845—Sale—Modern Triple Screw Houseboat—120' 9" x 21' x 3' draft. Designed by Tams & King and built in 1920—3 Meitz & Weiss Oil engines—6 staterooms, 4 bathrooms, dining saloon, deck sitting room etc.

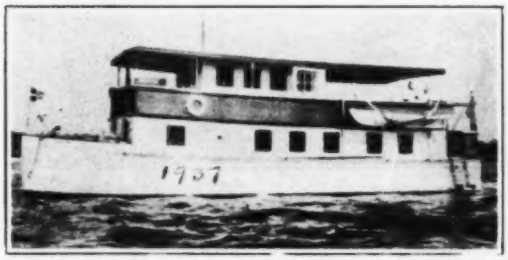


No. 1895—Sale charer—120' Twin Screw Houseboat 2-6 Cylinder 220 H. P. Standard Motors—7 staterooms. 2 bathrooms, large dining and sitting room.

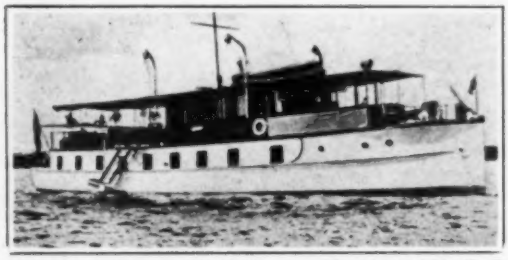


No. 1912—Sale—Charter—Attractive 77' Houseboat—2-50 H. P. Standard motors, speed 11 miles, 4 staterooms, dining saloon, deck saloon and 2 bathrooms.

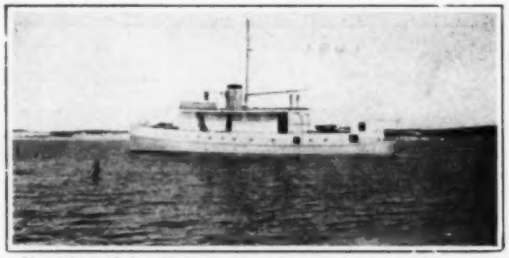
No. 1902—Sale—Charter—Desireable Houseboat 64' 6" x 17' 6" x 3' 2" draft. Built 1915—50 H. P. 20" Century Motor. Speed 9 miles—3 Staterooms, dining saloon and deck saloon, bathroom, etc.



No. 1937—Sale—Charter—50' x 15' x 3' draft—Built 1919. 3 Staterooms, dining saloon and bathroom.



No. 1800—Charter—80' Mathis type Houseboat, 2-70 H. P. Standard motors — 4 Staterooms, 2 bathrooms and 2 saloons.



No. 1941—Sale—Charter—Semi-Diesel Houseboat—100' x 23' x 4' draft—Built 1920—2-100 H. P. Fairbanks-Morse Engines. Large owner's accomodations.

Advertising Index will be found on page 110

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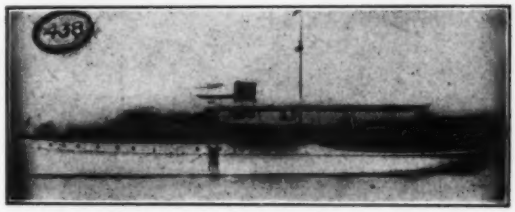
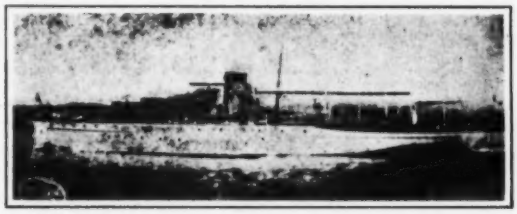
We have a complete list of all steam and power yachts, auxiliaries, and houseboats, which are for SALE and CHARTER. Plans, photographs and full particulars furnished on request.

No. 560—For Sale or Charter—75 ft. x 14 ft. x 4 ft. 6 in. gasoline cruiser built 1915. Sterling powered. Very able seaboat, excellent accommodations below and on deck. Has deck dining saloon, two large staterooms, large main saloon and bath room. Located Great Lakes. Reasonable price. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.

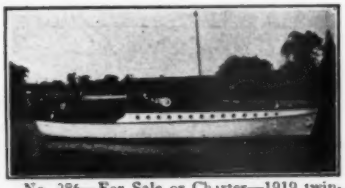


No. 438—For Sale—At a very attractive price. Twin screw cruiser 90 ft. x 5 ft. x 15 ft. heavily built of best materials and construction. Equipped with two heavy duty 20th Century motors. Deck dining saloon, very large deck space. Has two double and two single staterooms in owner's quarters, bath and two toilets. Very complete and the best of equipments. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.

No. 941—For Sale or Charter—Attractive twin screw houseboat, 85 ft. x 19 ft. x 3 ft. 20th Century engine. Conveniently arranged. Large deck saloon. Five staterooms, three bathrooms. Handsomely furnished. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

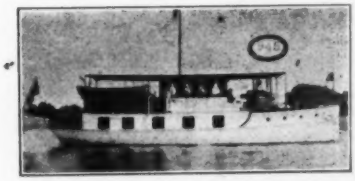


No. 428—For Sale by Estate: Very able twin screw power yacht. 98 feet by 16 feet 6 inches by 4 feet 6 inches draft. Four staterooms, bathroom and two toilets. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.



No. 986—For Sale or Charter—1919 twin-screw cruiser. Houseboat type. 62 ft. x 15 ft. 4 in. x 2 ft. 5 in. Sterling motors. Speed 12 miles. Attractively arranged and furnished. Constructed for use in northern and southern waters. Edward P. Farley Company, 6 North Michigan Avenue, Chicago, Ill.

No. 1018—For Sale—54 ft. twin-screw excellent cruiser. Speed 20-25 miles per hour. Double stateroom and large main saloon. Two toilets and shower bath. Well equipped and in excellent condition. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.



No. 945—For Sale or Charter—Modern 52 ft. houseboat. Recent build. One single, one double stateroom and bath. Attractively furnished. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

No. 768—For Sale—A 45 ft. Elco cruiser of excellent construction. Fully equipped for cruising. Accommodations consist of double stateroom aft; main saloon forward, with four berths, two toilets, large galley, etc. Motor controls from bridge. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.

No. 977—For Sale—50 ft. Great Lakes Cruiser. Speed up to 20 miles. Accommodate 6 to 8. Excellent condition throughout. New motor 1922. Reasonable price. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

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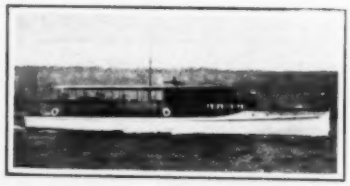
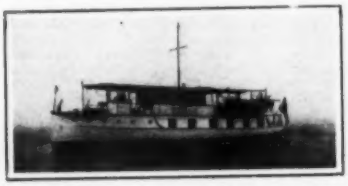
No. 2254—55 ft. bridge deck cru'ser. Two double staterooms, main saloon, two toilet rooms. Two berths and toilet for crew. Sterling Motor. Speed 13-14 miles. Electric lights, etc. Splendid proposition.

No. 1780—75 ft. Twin Screw Power Yacht. Two double staterooms; Three berths in main saloon; Sofa berth in deckhouse; Two toilets and 15-18 Knots. Price attractive.

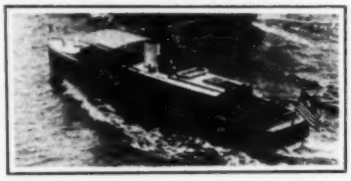


No. 2039—80 ft. Twin Screw Power Yacht. Three staterooms; Saloon and Dining saloon. Two toilets and bath. Two 150 H. P. Motors; Speed 18 miles. Electric lights, etc. Splendid proposition.



No. 4430—60 ft. Power Houseboat. Two double and one single staterooms; Two berths in dining saloon; Sofa berth in deckhouse; Two toilets and bath. Captain's room, etc. 70-90 H. P. Standard Motor. Speed 12-13 miles. Hot water heat; Electric lights, etc.

No. 2358—60 ft. Twin Screw Power Yacht. Double stateroom; Main saloon with two berths. Bath; etc. Two 50 H. P. Sterling Motors. Speed 14 miles. Electric Lights etc. Splendid proposition.



No. 2359—50 ft. Twin Screw Express Cruiser. V Bottom; Double planked mahogany and teak. Two 200-225 H. P. Sterling Motors; Speed 30-32 miles. Ideal for ferry service.

FRANK BOWNE JONES

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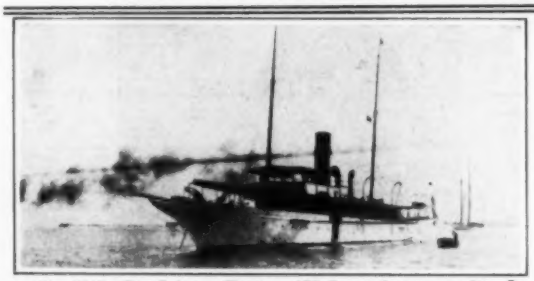
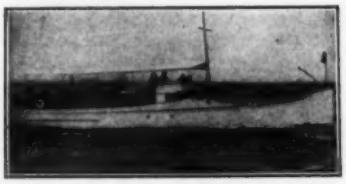
SALES AND CHARTERS—NAVAL ARCHITECTURE—MARINE INSURANCE

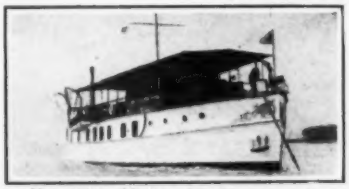


No. 5547—For Sale or Charter—170 ft. steel steam yacht. In excellent condition throughout. Dining saloon and social hall on deck. 6 staterooms, 2 baths. Frank Bowne Jones, Yacht Agent. 25 Broadway, New York.

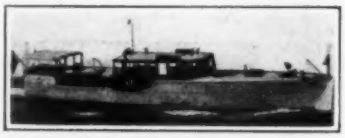
No. 6692—For Sale—83 ft. Twin Screw Power Yacht; best design and build; 20th Century Motors; Deck saloon; double and single staterooms, dining saloon and bath below. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 1175—57 ft. Elco Cruiser—2 double staterooms and saloon—6 cyl. Sterling motor, good as new. Frank Bowne Jones. Yacht Agent. 25 Broadway, New York



No. 6913—Mathis 75 ft. power house yacht. Deck dining saloon and 4 staterooms, baths, handsomely furnished. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 3898—For Sale—Practically new 75 ft. Lawley Twin Screw Express Yacht; Speed 21 miles per hour; Sterling motors; Excellent accommodations; Price reasonable. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.

Advertising Index will be found on page 110

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We have a complete list of Yachts of every description for sale and charter

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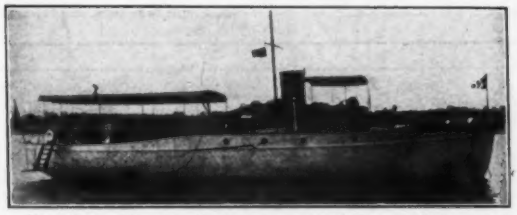
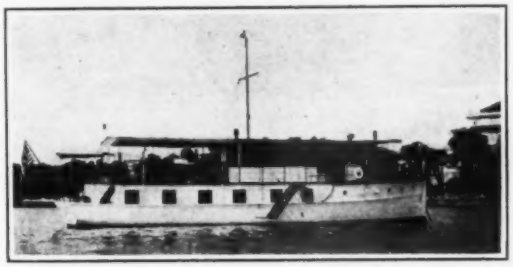
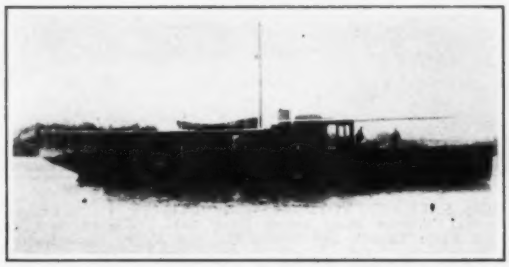
No. 4456—Excellent twin-screw power yacht, 72 ft. x 12.3; Lawley built, two 6 cylinder Wintons; speed 13 knots; two double staterooms, bathroom, dining saloon, etc.



No. 1949—Able raised deck cruiser, 62 ft. x 12.9; new 8 cylinder Sterling motor; speed 13½ miles. Single and double stateroom, main saloon etc. In first class condition.



No. 118—Ideal Florida houseboat, 61'x16.2x3.2; built by Mathis Company in 1920; six cylinder Standard motor; two double and on single stateroom, two saloons, etc.



No. 1852—Twin screw power yacht, 95'x16'x4'6"; built 1917; two 6 cylinder Winton motors; flush deck type, with continuous deckhouse. Splendid boat for Southern waters. Best possible condition.

Telephone Vanderbilt 10499

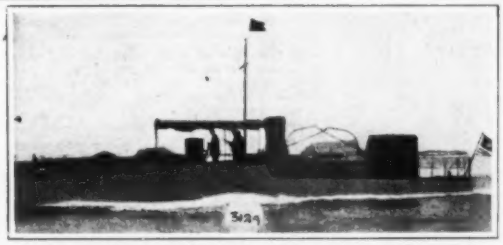
Suite 401

R. M. HADDOCK

NAVAL ARCHITECT and YACHT BROKER

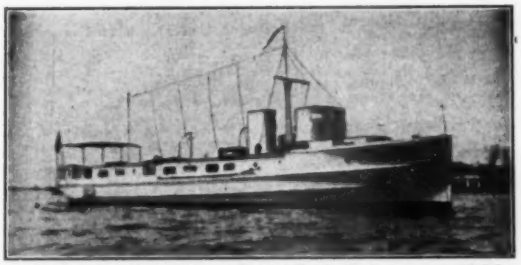
50 East 42nd Street, New York

Marine Insurance



No. 3124—For Sale—Fast twin screw cruiser 55 ft. x 9 ft. x 3 ft. 6 in. draft. Two six cylinder motors 150 H.P. each. Speed up to 24 m.p.h. Ideal boat for fast ferry service. Price reasonable for a quick sale. For further particulars apply R. M. Haddock, Naval Architect & Yacht Broker, 50 East 42nd St., N. Y. C.

No. 3120—For Sale: Express cruiser designed and built by the Great Lakes Boat Building Co. Twin screw. Speed up to 20-22 m.p.h. One double stateroom. Now in commission. For further particulars apply R. M. Haddock, Naval Architect & Yacht Broker, 50 East 42nd St., New York City.



No. 316—For Sale: 59-foot Bridge Deck Cruiser, recent build. 70-90 H.P. Sterling engine 1917. A very able boat, economical to run. Price very reasonable. Apply R. M. Haddock, 50 East 42nd St., New York City.

No. 368—For Sale: Twin screw express cruiser 57 ft. x 10 ft. x 3 ft. draft. Excellent condition. Sterling motors. Speed up to 25 m.p.h. Two double staterooms. Can be purchased at a very reasonable figure. For further particulars apply R. M. Haddock, Naval Architect and Yacht Broker, 50 East 42nd Street, New York City.

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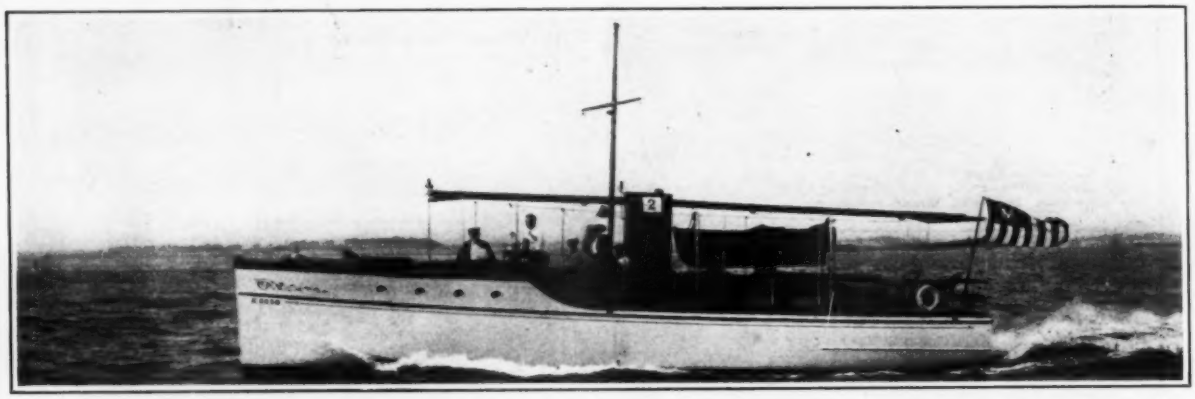
Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



FOR SALE—SPENDTHRIFT II, 45'6½" x 11'3" Bridge Deck Cruiser, practically new. One of the most successful cruisers in New York waters. Winner Block Island Race, 1921. Winner New York-Atlantic City Race, 1922. Designed by Chas. D. Mower, built 1921 by New York Yacht Launch and Engine Co. 50 H. P. four-cylinder 5½ x 6" Van Blerck engine, electric starter, three ignition systems and best of equipment. Independent electric generating plant. Speed 12 miles. Two roomy cabins with separate toilets; galley and large engine rooms amidships separated by watertight bulkheads, eliminating motor noise and odor. A good sea boat, ideal for Sound, ocean and Southern cruising. Write today for full details and price. W. R. Halsey, Mamaroneck, N. Y.

DIESEL ENGINES FOR SALE

AT VERY ATTRACTIVE PRICES

225 BHP Winton Diesel 500 BHP Winton Diesel

WHITTELSEY & WHITTELSEY, *Engineers*

17 Battery Place, N. Y. C. Tel. Whitehall 1414

For Charter

I own four cruising motor boats now at Miami for seasons charter. All carefully equipped and terms right to responsible parties. Capt. Scott., 236 S. W. North River Drive, Miami, Fla.

Florida tourist and yachtsman wanting to charter or purchase a yacht or small motor boat for the winter season, can get all information they desire by writing Capt. J. L. Scott, 236 S. W. North River Drive, Miami, Fla.

Hull: 21x20x5x2. All piano finish mahogany. Finest construction and condition. Cost $2,600 —Price $600. Ford, 31 East 42. N. Y. C.

Atkin Stock Plans of Small Boats—*Bonita*, 21ft. Seabright skiff: *Cabrilla*, 26ft. by 6 ft. high speed V bottom runabout: *Dusty*, 20 ft. by 5 ft. V bottom runabout: *South Wind* 36 ft. by 12 ft. auxiliary ketch: *Fanner*, 22 ft. air drive runabout, shallow draft: *Fair Wind*, 25 ft. by 9 ft. skipjack centerboard schooner: *Black Duck*, 15 ft. outboard motor punt: *Coot*, 17 ft. by 6 ft. cat-rigged bateau: *Splash*, 21 ft. by 7 ft. flat bottom motor cruiser: *Gamecock*, 26 ft. by 8 ft. V bottom motor cruiser; and many others from 6 ft. to 45 ft. in length. Moderate prices to amateur builders. William Atkin, Naval Architect, Huntington, L. I., N. Y.

I have 25 ft cruiser and will make unbinding partnership with one or two Protestants, experienced, about 26. Best of references required. Investment not necessary. F. H. Roehrig, 414 Quincy St., B'klyn.

TRIMOUNT WHISTLE BLOWER OUTFITS

Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.

Made in 3 sizes.

TRIMOUNT ROTARY HAND BILGE PUMPS

All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.

Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.

30 Heath Street Boston, Mass.

(Factory: 292 Whiting Ave., E. Dedham, Mass.)

For Sale—Power cruiser 47 ft. x 12 ft. x 3 ft. 9 in. Built August, 1920. Speed 12 M.P.H. 4 cyl. Sterling engine. Separate electric lighting plant. Mahogany finish below and on deck. 3 toilets. Crew's quarters sleeps two. Owner's quarters, two staterooms and main saloon, sleeps seven. Bridge deck control. Engine room in separate compartment under. In A1 shape, fully found and now in commission. For further particulars address MoToR BoatinG, Box 35.

"FOR SALE:" Beautiful Cruiser for southern waters. Bridge Deck-Burger Built 1921 name "Hoodathunkit." Exhibited at Motor Boat Show 1921—Scripps Motor 34—4cyl. 4cycle. Length 36 feet, Width 9feet. Sleeps 6 persons, fully equipt, galley and two toilets. Address Palmer Campbell, 1 Newark St., Hoboken, N. J.

LAMB 60 H. P. 6 cyl. Engine A-1 condition Propeller and complete price $600.00 Box (43) Motor Boating.

For Sale—New and rebuilt marine engines. Write for list of bargains. Anderson Engine Co., 4032 No. Rockwell St., Chicago, Ill.

Cruiser Wanted: Music dealer wishes to exchange your choice electric reproducing pianos, value $2500 to $3000 for cruiser of equal value Box 41, MoToR BoatinG.

For Sale — Yachts, motor dinghy, 12 ft. clinker built. Varnished bright. Regal engine, first class condition. Can be seen New Rochelle Yacht Club, or address H. H. Morton, 32 Schermerhorn St., Brooklyn, N. Y.

BARGAIN PRICES—We have the following new KERMATH motors, that we are selling at bargain prices, as follows:

9-KERMATH 20 H. P. Four Cylinder, Four cycle, marine motors, unit power plants, complete with Kingston Magneto, Batteries, Spark Coils, Switch, Spark Plugs, Motor Wiring, KERMATH Reverse Gear on extension base, Carburetor, Splash System of Lubrication with Plunger Pump, Rotary Water Pump, Inside Stuffing Box, Shaft Coupling, Steel Shaft, Bronze Propeller, Starting Lever, Tools and Oil Can. BARGAIN PRICE $353.50 2-KERMATH 20 H. P. Motors with above equipment and including Electric Starter and Generator and Battery complete BARGAIN PRICE $458.50

These motors are brand new and have never been used and before shipment will be given final test to insure their being in perfect order. MULLINS BODY CORPORATION, BOAT DEPT., SALEM, OHIO.

65-75 H. P. Standard rebuilt good as new motor $1200. Pair 65-75 H. P. Standards $2000. 65-75 H. P. Standard $800. 60 H. P. Crair $1000. 75 H. P. Automatic $800. 32-37 H. P. Standard $600. 27 H. P. Wolverine $500. Ed. Kiel, 151 St., North River, New York City.

FREE Illustrated Literatures. Outboards, New and Rebuilt Engines. Universal Joints, Pumps, Clutches, Gears, Hyde's, Gordon Reversible Propellers, etc. Canadian Boat & Engine Exchange, Toronto.

Express Cruiser wanted about 43 ft. Box 42, MoToR BoatinG.

A few pair of very powerful and clear Bausch & Lomb Prism Binoculars, 6 x 30 power, complete with case, etc. Worth $75.00, will take $40.00. Percy M. Child, 1110 14th St., N. W., Washington, D. C.

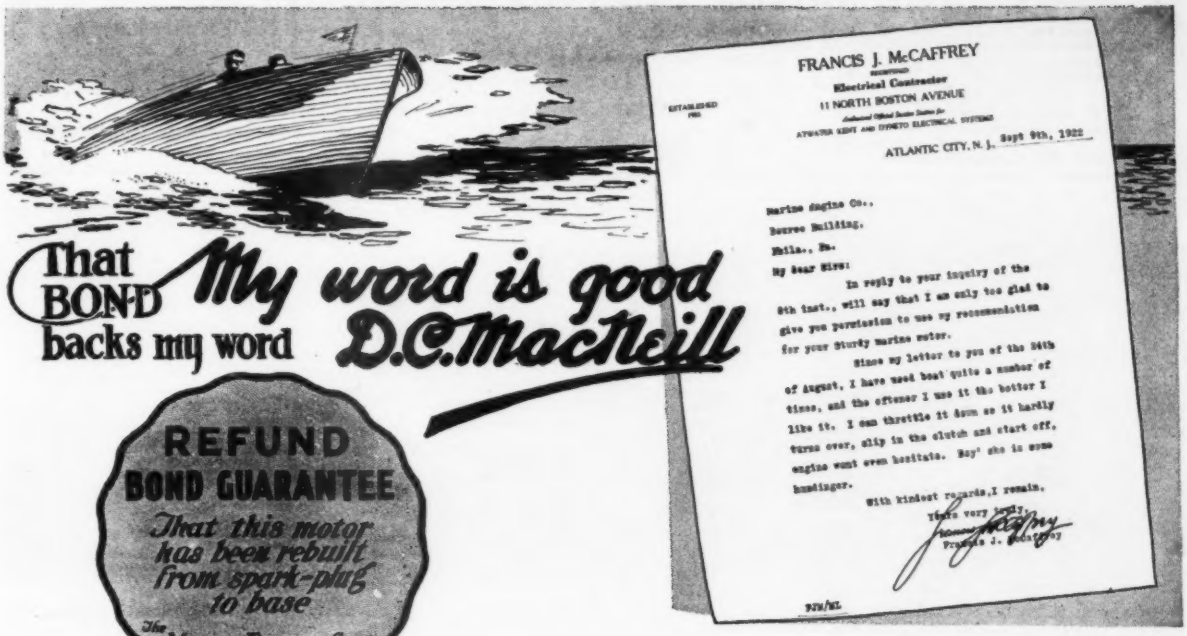
One 70 volt, 75 amp. direct connected Winton four cylinder generating plant, worth $1250.00, will take $500.00. One 110 volt, 39 amp. direct connected Winton four cylinder generating plant, worth $1250.00, will take $600.00. One 110 volt, 15 amp. direct connected one cylinder Carlisle & Finch generating plant, worth $350.00, will take $175.00. One 18 in. Rushmore search lamp, 35 amp., deck type, will take $125.00. One set large galv. running lamps, both oil and electric, suitable for vessel up to 100 ft., complete four lamps, $20.00. Let me quote you on marine search lamps, all sizes. Percy M. Child, 1110 14th St., N. W., Washington, D. C.

Four Cycle

4 HP Dunn, 2 cyl	$40.00
6 HP Dunn, 3 cyl	55.00
10 HP Doman, 2 cyl	110.00
12 HP Holliday, 2 cyl	105.00
12 HP Lamb, 2 cyl	115.00
12 HP Samson, 3 cyl	95.00
16 HP Dunn, 4 cyl	115.00
25-30 HP *New* Erd, 4 x 6, 4 cyl	215.00
45-50 HP Globe, heavy duty, with gear, etc.	650.00
One Cylinder, Two Cycle	
4 HP New Perfection	$65.00
6 HP Williams, heavy duty	55.00
8 HP Pierce, "as is"	35.00
Two Cylinder, Two Cycle	
6 HP Gray	$65.00
10 HP Northwestern	75.00
15 HP Ferro, "as is"	45.00
Three Cylinder, Two Cycle	
12 HP LaCrosse, "as is"	$35.00
15 HP Elmore	55.00
25 HP Ferro, 5 x 5, 2 cycle	115.00

THE BADGER MOTOR COMPANY

Milwaukee, Wis.


That BOND backs my word
My word is good
D.C.MacNeill
REFUND
BOND GUARANTEE
That this motor has been rebuilt from spark-plug to base
The MARINE ENGINE CO
PHILADELPHIA
FRANCIS J. McCAFFREY
Electrical Contractor
11 NORTH BOSTON AVENUE
ATLANTIC CITY, N. J. Sept 9th, 1922
Marine Engine Co.,
Bourse Building,
Phila., Pa.
My dear Sirs:
In reply to your inquiry of the 6th inst., will say that I am only too glad to give you permission to use my recommendation for your Sturdy marine motor.
Since my letter to you of the 24th of August, I have used boat quite a number of times, and the oftener I use it the better I like it. I can throttle it down so it hardly turns over, slip in the clutch and start off, engine wont even hesitate. Say' she is some huntinger.
With kindest regards, I remain,
Yours very truly,
Francis J. McCaffrey
FJM/HL

-and we do NOt pass the buck

For Every Type

For every type and load-line length of power craft, we offer a reliable Marine Motor—from only the admitted BEST makers. Whatever your personal wish dictates, or your purse permits, we can sell you your biggest money's worth. And you can trade in your old engine as part payment, if you want to, and get a square deal.

New and rebuilt engines for instant delivery at all seasons. Let me send you this month's Red List of Rebuilt Engines. There must be some price bargain in it you'll jump at!

THE MARINE ENGINE COMPANY
OF PHILADELPHIA
Machinery Hall - Bourse Building

This Company is Authorized Distributor for:
Hall-Scott Scripps Niagara
Wright Reliable Gray (2 and 4 cycle)
Sturdy
Automatic Brennan-Standard Universal
(2 to 25 watt) Electrical Plants
Hyde Propellers Sterling Propellers
In STOCK Rebuilt Engines include: Sterling, Peerless, Automatic, Lamb, Van Blerck, Hall, Red Wing, and many other makes from 2-h-p up.

Same as in your business, most likely. Every once in so often a Jonah butts in on the performance of a marine engine. One we sold Mr. McCaffrey had a Jonah sitting on it, probably.

Anyway, Mr. McCaffrey didn't get what he paid to get; and he kicked. He said: "Your word is good, you say? Come through."

Ask him if we did. Let him tell how quickly we snatched that Jonahed engine out of his reach—and put one in its place that delivered what he bought: SATISFACTION.

We do NOT pass the buck. We cannot afford to argue the point with a buyer who isn't quite happy over his purchase. My word IS good. And that Surety Bond issued with each rebuilt engine by the Fidelity and Casuality Co. of New York backs it up

> Right alongside the maker's name-plate, on any rebuilt engine you buy from us, a Seal is fastened. That Seal says to you: We refund the purchase price if it isn't true that this engine was rebuilt from bed-plate to spark-plugs. The motor tested, run and passed as perfect by our inspector before it is refinished for sale to you.

If that isn't fair,—if my word and Bond don't seem enough—tell me what would be enough!

D. C. MacNeill

MARINE ENGINE CO

MACHINERY HALL of PHILADELPHIA BOURSE BUILDING

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 6 cents per word, minimum $1.50. If an illustration is used, the charge is as follows, which includes the making of the cut:

Cut one inch deep, two inches wide..... $ 7
Cut 1½ inches deep, three inches wide..... $10
Cut 2¼ inches deep, four inches wide..... $15
Cut 2¾ inches deep, 7 inches wide..... $20

Terms: Cash with order.

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.

Classified advertisements set entirely in small light face type. No extra charge for capitals. Bold face type used at display rate, $12 per inch, single column.

FOR SALE—FAMOUS "BABY SURE CURE." Fastest single engined hydroplane ever built. Holds world's record for fastest lap in its class, 65.4 miles per hour in a rough sea, made at Chicago Regatta 1922. Also holds world's 30 mile record. Will positively do 70 m. p. h. on a one mile course. Considered the best all-weather hydroplane in America. In perfect condition and will demonstrate on the Detroit River to prospective purchasers until the ice forms. High compression 450 H. P. motor equipped with special Dow Metal pistons, flywheel, self starter, Sprung one way clutch. Cross water cooled gear box, automatic air pump, couplings and bearings, extra propellers, Pyrenes and all equipment complete. Write today for price and full details. Paul Strasburg, 51 Sproat Street, Detroit, Mich.

Miami———Florida.

WANTED—Auxiliary Cruiser, heavily timbered. Have Entire Island, Sandy Beach, Cocoanut Palms, Lower East Coast Key. Finest Fishing, Wild Pigeons, Ducks, etc. Valued at $10,000. WANTED—40 to 50 Cruiser. Have Equity of $2,900 in Philadelphia Home, Balance Payable $40 per Month. Valued, $7,500. Snare & Co., Yacht Brokers, Estate Agents.

For Sale: BOAT FACTORY, and store houses for boats on Chautauqua Lake Outlet, Jamestown, New York. One acre, running from road to outlet, one hundred and twenty-four feet wide on road, three hundred and thirty-three feet deep to outlet. Nice bungalow, seven rooms and bath, work shop all-equipped, boat-houses and stalls all hired. Information and terms address, G. T. Bouch, Box 214, Celoron, Chautauqua County, New York.

Cabin Cruiser—26x7, 12 H. P. Lathrop, toilet, sink, 30 gallon water, 2 gas tanks, 2 spring bunks, stoves, ice box, mast, tender, fully equipped for cruising. For quick sale $450. John Larsen, Highland Hotel, Springfield, Mass.

REBUILT ENGINES

"THROUGH SERVICE WE GROW"

The Largest Distributors of New and Rebuilt Engines in the World

Our stock consisting of almost three hundred new and slightly used motors (more than was displayed at the entire New York Motor Boat Show) embraces all sizes, types and makes. Rebuilt, guaranteed and sold at a price consistent with the times. Let us figure with you on your next power plant.

Advise size and type of your boat and about the size engine you want.

Our bargain list will be sent anywhere on request.

Bruns, Kimball & Company
153-155-157-159 West 15th St.
New York City

Available for southern Winter charter any time after Oct. 1st, 1922. 52' Mathis house-boat, built 1920. 60 H. P. Standard motor. Hot water heat. Large owners' state-room, single state-room, dining saloon, bath room and large deck house. Will sleep nine comfortably besides the crew. Completely and beautifully equipped, silver-ware, bedding, dishes, etc. Carries 14' power tender and 10' row-boat on davits. I will consider a very low figure on a charter for the time consumed in taking the boat from New York to Miami, or other Southern destination. Further particulars—M. C. Kimball, 153 West 15th Street, New York City. Or your own broker. Phone 0468 Watkins.

Honestly Rebuilt

Don't buy any motor until you have our latest price list of Masters Rebuilt Motors. Thoroughly overhauled, all worn parts replaced, refinished and guaranteed like new. All sizes. Lowest prices. Write to-day.

W. L. MASTERS & CO.
Largest Engine Dealers in Central West
231 No. State St. Chicago, Ill.
AUTHORIZED DISTRIBUTORS FOR
STERLING KERMATH UNIVERSAL FRISBIE
STEARNS EVINRUDE JOHNSON
HYDE PROPELLERS JOES REVERSE GEARS

Advertising Index will be found on page 110

NAVAL ARCHITECTS & YACHT BROKERS

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER
Offices:
Lafayette Bldg., Chestnut and Fifth Sts.
PHILADELPHIA, PA.

BURGESS & PAINE
NAVAL ARCHITECTS
YACHT BROKERS
131 STATE ST. BOSTON, MASS.

COX & STEVENS
Naval Architects and Engineers
Yacht Brokers
25 Broadway, Cunard Building
(Morris St. Entrance), New York City
Telephone 2700 Whitehall

B. T. DOBSON
Naval Architect Yacht Broker
(P. O. Box 407) New Bedford, Mass.
Designer of Sailing Craft, Auxiliaries and Motor Boats. Specialist in V-Bottom Type.

William H. Hand, Jr.
NAVAL ARCHITECT
NEW BEDFORD, MASS.
HAND-V-BOTTOM DESIGNS
Every design, now as always, my personal work. Send stamp for catalog illustrating forty-three typical Hand-V-Bottom designs.

R. M. HADDOCK
NAVAL ARCHITECT
Sail or Power Yachts, Houseboats and Commercial Vessels
Yacht Broker Sales and Chartering
50 East 42nd St. New York City

CHARLES D. MOWER
Designer of
SENSIBLE CRUISERS
POWER—SAIL—AUXILIARY
Twenty-five years' practical experience
350 Madison Avenue New York City

FREDERIC S. NOCK
NAVAL ARCHITECT
Yacht Builder, Marine Railways.
Storage and Repairs
East Greenwich, Rhode Island, U S A

Questions and Answers Lesson No. 8

Continued from page 33

49. Q: What does an arrow without tail feathers indicate?
A: *Ebb.*
50. Q: What do the figures printed alongside of an arrow indicate?
A: *Strength or velocity of current, expressed in knots.*
51. Q: How does one tell whether certain figures printed on the chart indicate depth of water or the number of a buoy?
A: *The number of a buoy is indicated by Italic type and depth by Roman type.*

Give the meaning of the following markings shown on a chart:

52. Q: rky A: *Rocky.*
53. Q: stk A: *Sticky.*
54. Q: hrd A: *Hard.*
55. Q: sft A: *Soft.*
56. Q: bu M brk Sh A: *Blue mud, broken shells.*
57. Q: hrd S A: *Hard sand.*
58. Q: crs yl S bk Sp A: *Coarse yellow sand with black specks.*
59. Q: fne dk gy S M A: *Fine dark gray sand with mud.*
60. Q: gy S bu M brk Sh A: *Gray sand, Black mud, broken shells.*
61. Q: fne yl gy S A: *Fine yellow gray sand.*

(*Continued on page 108*)

Successful Correspondence Course Student

The names of all students who have submitted papers during the months of August and September are printed below:

Lesson No. 1: Robert Arndt.

Lesson No. 5: A. F. Alexander, John Lang, Charles Nagel, Charles Ruder, J. L. Saegmuller, Meredith Scott, L. A. Sackett, W. J. Schoepfle, F. W. Salmon.

Lesson No. 6 & 7: Charles Nagel, Thomas Steinger, J. L. Saegmuller, August G. Weber, Roy E. Williams.

Lesson No. 8: Charles Nagel, Charles Ruder, Thomas Steinger, August G. Weber.

Lesson No. 9: Frederick Lewis, Charles Ruder, Thomas Steinger, August G. Weber,

Lesson No. 10: K. DeHaart, August G. Weber.

Lesson No. 11: K. DeHart, A. F. Keck, Walter Monroe, Barbara F. Smith.

Lesson No. 12: K. DeHaart, A. F. Keck, Barbara F. Smith

Lesson No. 13: K. DeHaart, A. F. Keck, H. Lloyd Williams.

The following are entitled to Pilot Certificates:

K. DeHart, H. Lloyd Williams, Walter Monroe.

The following have successfully passed lessons in Dead Reckoning Course:

Lesson No. 1: Forrest D. Greene, Jr., W. A. Smelser, Charles E. Stanton, Fred Walter, Claude E. Wilson.

Lesson No. 2: J. C. Morrell, Ian L. McKenzie, W. A. Smelser, Charles E. Stanton, Fred Walter, Claude E. Wilson. William O. Yates, E. T. Youngfelt, C. S. Young.

Lesson No. 3: L. G. Barton, B. B. Eyalfson, W. J. Mozart, J. C. Morrell, Ian L. McKenzie, Walter Monroe, W. E. Roberts, W. A. Smelser, Fred Walter.

Lesson No. 4: R. B. Eyalfson, Ian L. Mc Kenzie, W. A. Smelser, Charles E. Stanton, Fred Walter, Claude E. Wilson,

Lesson No. 5: R. Andren, L. P. O' Keefe, William H. Palmer, F. B. Smith, Fred'k. W. Saalmon, Fred'k. E. Smith. W. A. Smelser, Fred'k. Walter, V. C. Baird, Percy S. Benedict, L. G. Barton, Elmer L. Belanger, W. A. Cornell, John C. Broadhead, Albert J. Fenton, Vincent Francis, William O. Yates, C. S. Young. H. T. Zachgo, Frank Zueger.

Lesson No. 6: R. Andren, L. P. O' Keefe, Fred'k. E. Smith, W. A. Smelser, Fred Walther, V. C. Baird, Percey S. Benedict, L. G. Barton, Vincent Francis, William O. Yates, C. S. Young, H. T. Zachgo, Frank Zueger.

RALPH E. WINSLOW
Naval Architect
River Street, ATLANTIC, MASS.
Designer of high grade wood and steel, Steam, Motor, Auxiliary and Sailing Yachts and Commercial Vessels.
18 years' experience. Stock plans.
Phone Granite, Mass., 1011 or 2599-M

The "HOUSE of WOOD"

FOR sixty-two years the HOUSE of WOOD has catered to the most discriminating yachtsmen and naval architects. Sail and power yachts of the finest quality.

An Old Yard with a New Business Policy

Superior workmanship at moderate prices.
Let us quote on your work

B. F. WOOD
Incorporated
Marine Street, City Island, New York City
Building Refitting Repairs Storage

Produces the equivalent of $1.40 worth of dry cell batteries for 25c

The Storage Battery Magno is fully charged by simply unscrewing the cover and inserting a "spare" electrode. "Spares" are exchangeable at your dealers or direct from our factory at 25 cents each. Every Magno "spare" charge will do the work of 2 dry cells and will outlast 2 such sets of dry cells. Thus for 25 cents you get the equivalent of 4 dry cells.

Another feature of the Magno is that the "spares" are always ready for use. They won't run down prior to inserting them in the acid and need no more care than a hammer.

By keeping a "spare" on hand you will never be without current for motor boat ignition, cabin and running lights, radio, etc.

Learn more about this unusual battery. Write today for folder M.-1-11.

Magno Storage Battery Corp.
Aeolian Bldg. New York

STORAGE BATTERY
MAGNO

Yard and Shop

(Continued from page 40)

Motor Boat Show Dates

The tentative announcement has been made by the National Association of Engine and Boat Manufacturers, Inc. that the 1923 Motor Boat Show will probably be held at the Grand Central Palace, New York, during the period from Wednesday, February 21 to and including Saturday, March 3.

Due to structural changes which are being made in the exhibition building it has not been possible to complete final arrangements before this.

Yacht Clubs Please Note

An attractive moving picture film of racing scenes taken at prominent regattas during the season, has been prepared by the Hall-Scott Motor Car Company. This will be loaned to responsible clubs for use at entertainments, smokers, or similar festivities. The total length is about 1,000 feet or a twenty minutes run. A request addressed to the Eastern Sales and Service Branch of the Hall-Scott Motor Car Co. at 885 Niagara St., Buffalo, N. Y., will be promptly attended to.

Business Opportunity

MoToR BoatinG is in a receipt of a communication from the firm of Snell & Von Turbergen, Stadhouderskade, 32, Amsterdam, Netherlands, in which they request that manufacturers of engines and accessories suitable for boat work communicate with them, with a view of establishing business relations with them. They are now the sole distributors and agents for the complete line of Evinrude motors as well as the Johnson detachable motors and are in a position to dispose of other products by reason of their well organized sales force which covers the entire country. They are in regular contact with the Dutch trade, both dealers and jobbers, and have the best connections.

Motorboat Nomenclature

At the meeting of the S. A. E. Motorboat Division in New York, a sub committee was appointed, consisting of Irwin Chase of the Elco Company, W. J. Deed a naval architect, and Leonard Ochtman, Jr. They are to study the situation and report suitable ways of standardizing this phase of the industry. This division is working on other subjects also which include couplings, manifold connections, tachometer drives, stuffing boxes, and propeller shafting. They are further planning to take up the interchangeability of marine hardware and other boat parts. There is a demand for such standardization to decrease production costs, and enable builders to obtain material more readily.

Hall-Scott Motors Show Up Well

Following the conclusion of the summer's racing programs in all sections of the country it is interesting to note that Hall-Scott marine motors have been successful in annexing many of the victories. The original Belle Isle Bear Cat, owned by Dick Locke, of Detroit, with its original power plant, a four cylinder 125 horsepower Hall-Scott, at Put-In Bay, won one of the most closely contested races ever held among runabouts. The Interstate trophy given by the National Association of Engine and Boat Manufacturers was awarded for this race, which was limited to boats with a maximum piston displacement of 625 cubic inches. Another runabout, Falcon II, owned by Commodore J. Moore, of Lake George, won the National Championship Trophy for runabouts limited to 1100 cubic inches. She is powered with one of the six-cylinder 200 horsepower Hall-Scott engines of 824 cubic inches displacement. On the west coast, Apache, owned by Norman Devaux, of Oakland, Calif., was successful in defeating a number of other boats for the championship of Lake Tahoe. These were powered with engines of greater capacity than the six cylinder Hall-Scott engine in Apache.

Lucky Strike, another Los Angeles runabout, won the 605 cubic inch class races at Balboa without difficulty. She is also powered with a four-cylinder Hall-Scott marine engine, Probably the greatest event this summer was the ladies' race at the Detroit Regatta. Three stock Bear Cats equipped with 125 horsepower Hall-Scott motors were driven at over 35 m.p.h over the Gold Cup course. The ladies, Mrs. Stanley Morgan, Mrs. E. M. Gregory and Mrs. L. H. Thompson, who drove Roamer, Demon Bear Cat, and Bee, respectively, were obliged to start their engines, take their boats from the judges' barge without any assistance, and put them back of the starting line. They were given a five-minute preparatory gun, followed by a starting gun. It was demonstrated that a lady is not only able to handle these boats as well as the male drivers and owners, but Mrs. Morgan actually made better time over the same course than her husband had on previous days. Also

(Continued on page 98)

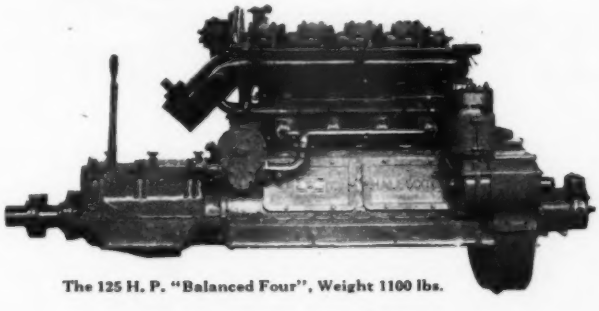
Advertising Index will be found on page 110

SEA SLED RUNABOUT
HALL-SCOTT
EQUIPT

The Sea Sled 25-ft. standardized mahogany runabout 25'8½" x 6' Speed 35 miles per hour.

AMONG the conspicuously successful standardized boats equipt with Hall-Scott Marine Motors is this latest Sea Sled runabout of which a large number have been built this year by the Sea Sled Company, Ltd., of West Mystic, Conn., and Canadian Vickers, Ltd., of Montreal.

The standard power equipment is a 125 H. P. "Balanced Four" Hall-Scott Marine Engine which drives her over the waves at the remarkable speed of 35 miles per hour. This makes a particularly desirable boat for high speed runabout service in shallow water or choppy seas because it combines Hall-Scott reliability and simplicity of operation with the peculiar Sea Sled characteristic of speed, seaworthiness, comfortable riding and dryness at high speed.



The 125 H. P. "Balanced Four", Weight 1100 lbs.

Hall-Scott Marine Motors have proven themselves ideally suited for fast runabout and express cruisers because they insure real power, dependability and freedom from mechanical troubles to a degree never before attained by fast turning marine engines.

If you are interested in fast boats of any type let us tell you what Hall-Scott Marine Motors are accomplishing in typical installations. Write today for descriptive catalogs.

Single and Twin Screw Plants in Stock at

Hall-Scott Motor Car Co., Inc.

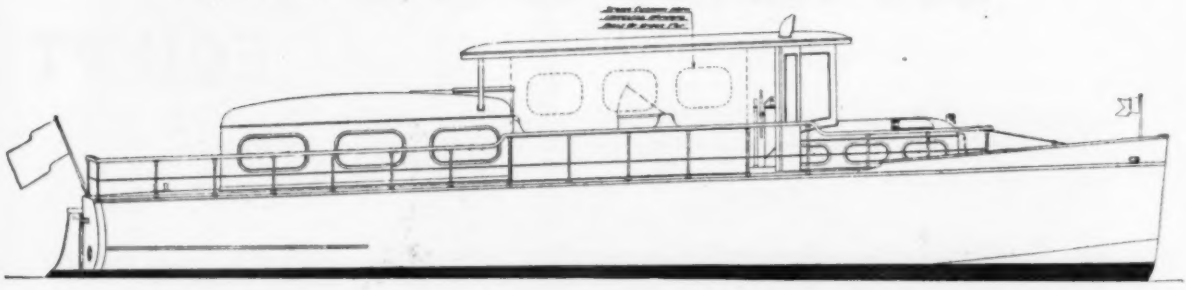
Eastern Sales and Service Branch

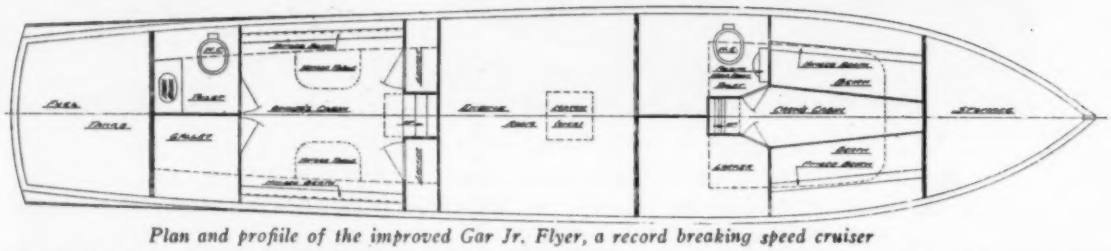
887 Niagara Street Buffalo, N. Y.

Factory: Berkeley, California

THE "Gar Jr. Flyer"

A New Standardized Guaranteed 30-Mile Commuter





Plan and profile of the improved Gar Jr. Flyer, a record breaking speed cruiser

Developed after the famous GAR JR II (shown below) (With Improvements in Profile, Deck and Internal Arrangement)

High Speed—Seaworthy
Dependable—Low Cost
Economical Operation

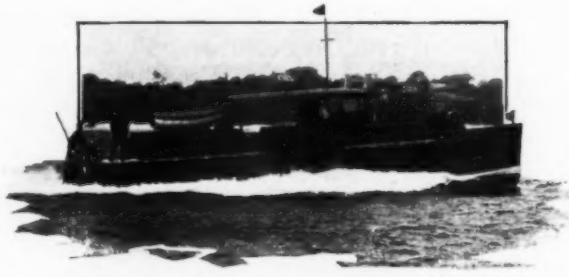
NEW YORK	Foot of East Twenty Third Street	to GREENWICH.....	55 Minutes
		" GLEN COVE.....	44 "
		" PORT WASHINGTON	42 "
		" OYSTER BAY.....	55 "
		" LARCHMONT	42 "
		" GREAT NECK.....	26 "
		" SOUTHAMPTON ..	4 Hours

Prompt Delivery

Now Available for Thorough Demonstration

Built By:—GAR WOOD, DETROIT, MICH.
Exclusive Sales Agents:—COX & STEVENS, NEW YORK

A 50-ft. twin screw motor yacht with sustained high speed, free of vibration, and remarkable seagoing qualities (as demonstrated by GAR JR. II in various long distance ocean races).



The hull construction is of highest grade (double planking—outer skin of mahogany). Fittings and furnishings of the best.

Power plant consists of two twin-six "Liberty" motors developing 450 H.P. each, perfect in balance and control, absolutely reliable, and practically automatic in operation.

A trained engineer will be furnished with each boat, and a guarantee from the builder as to speed and handling qualities.

For price, plans and full particulars, apply to

COX & STEVENS 25 Broadway, New York City

Telephone: WHITEHALL 2700

Advertising Index will be found on page 110

No Coal Famine at Miami Beach

YOU can enjoy summer sports and summer weather throughout the winter months if you make your home at Miami Beach. Here is the most favored spot in America, where the sun shines 365 days a year, where the winter climate is like a Northern June while the summer is actually more temperate than many northern cities.

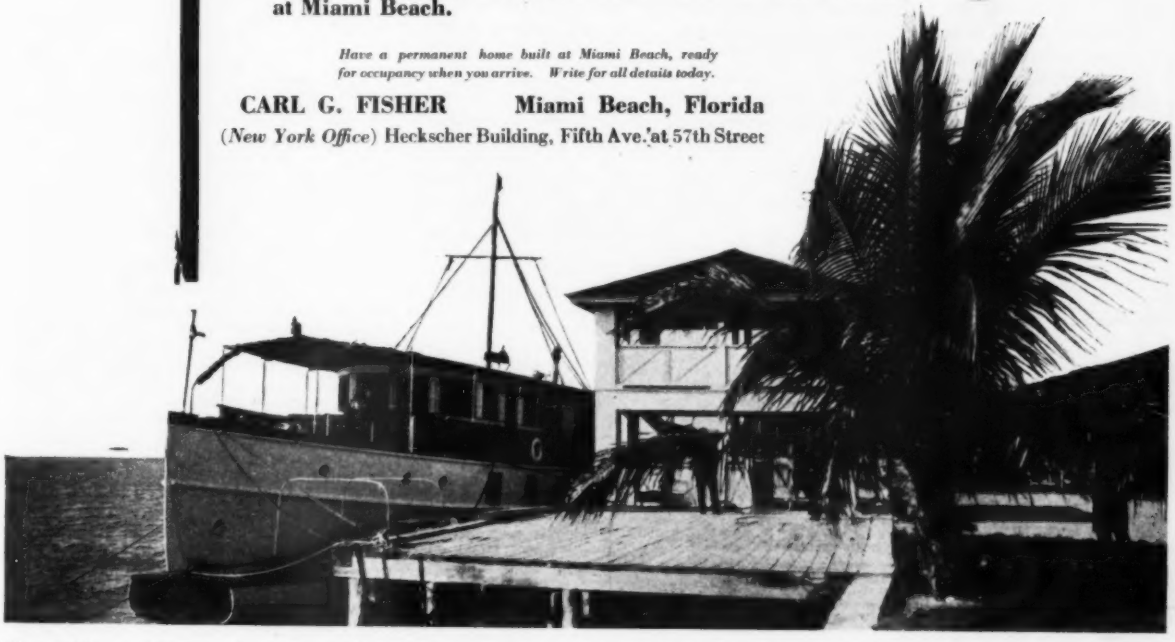
Not only has Nature endowed Miami lavishly in climate, vegetation and all natural charms but it possesses every modern improvement that can be wrought by the hand of man. Its hotels are faultless, its homes gorgeous, its facilities for sport and recreation unlimited. Boating, fishing, bathing, motoring, golf, polo, tennis are always in season.

Miami Beach is the yachting capital of Florida, the center of social life for those whose creed is to actively enjoy every day to the utmost. Life is worth living at Miami Beach.

Have a permanent home built at Miami Beach, ready for occupancy when you arrive. Write for all details today.

CARL G. FISHER Miami Beach, Florida

(*New York Office*) Heckscher Building, Fifth Ave. at 57th Street



—the battery that won't die when a wave slaps it

Think of all that this Columbia *Steel Case* "Hot Shot" Battery means to you users of ignition current!

Super-Durable—constructed to withstand the roughest service conditions

Waterproof—unaffected by exposure to the elements

Unbreakable— full service and life assured through protection of the battery by the steel case

➔ ***Costs No More Than Fiber Case Batteries***

Note:—This No. 1461 is the most popular for ignition, and is therefore the first to be made in steel. Other standard "Hot Shot" sizes will be made in steel as fast as practicable.

This 4 cellpower Columbia *Steel Case* "Hot Shot" Battery is the last step in perfect battery ignition. Costs little to buy; costs little to use; costs nothing to maintain, as it has no mechanical parts to protect from salt water spray or to fuss with. Extreme high power—extreme long life—better ignition than you have ever believed possible for your boat.

For sale everywhere by dealers in hardware, electrical equipment, and accessories; general stores; garages.

Always insist upon "Hot Shot"

NATIONAL CARBON COMPANY, INC.
Long Island City, N. Y.

Atlanta Chicago Cleveland Kansas City
San Francisco

Columbia Dry Batteries
—they last longer

Sea Sleds in South America

(Continued from page 13)

The contract under which the boat was built called for the carrying of 20 passengers and their baggage, a total weight of approximately 5500 lbs. at a speed of 30 m. p. h. and to run in less than 2 ft. of water. It can easily be seen that the fulfilling of this contract means a great deal to the country of Colombia, and for that reason the progress of the boat has been closely followed, and its launching anticipated keenly by the more prominent Colombian business men and Government officials. The success of these boats means to that country the revolutionizing of their entire transportation system, opening up of possibilities in the development of the natural resources.

The date of the launching was set for September 22, and a very large body of prominent Colombians left New York on the train of that day arriving at New London from which point they were carried by motor cars to the plant of The Sea Sled Company, Ltd., at West Mystic. This party was headed by Senora Carolina de Ospina, wife of the president of Colombia, accompanied by her daughter Senorita Elena Ospina, Senor E. Olaya-Harrara, Colombian Minister to the United States and his wife, Senora Olaya-Harrara, and included most of the prominent Colombians now in this country, a great many of whom were here for this particular occasion. Arriving in New London they were greeted by representatives of the City, and the Chamber of Commerce. City Manager James E. Barlow, City Councillor Waldo E. Clark of the Rivers and Harbors Commission, James P. Sullivan President of the Rotary Club, James G. Hammond Secretary of the Chamber of Commerce and Mrs. Hammond. A reception was held at the railroad station in honor of the visitors, and the ladies of the party being presented with floral tributes by Mrs. Hammond representing the appreciation of the ladies of New London in honor of the visitors.

The launching took place at the scheduled time, the new ship being sponsored by Senora Carolina de Ospina. In her official launching party were included Senorita Elena Ospina, Senor and Senora Olaya-Harrara, Mr. and Mrs. Henry B. Plant, Dr. Jose Ma. Orango, Consul General of Colombia to the United States, and his wife Senora Orango.

Immediately following the launching official trials of the new boat were held, the results obtained being most startling. On the first run a load of 27 passengers was carried, a total passenger weight of 4320 lbs. The four Sterling motors ran at 1450 R. P. M., and a resulting speed of 34.61 M. P. H. was obtained. On the second run a load of 48 passengers was carried, a total passenger weight of 6815 lbs. With the engines running at the same speed as the first run, namely, 1450 R. P. M., a speed of 32.93 M. P. H. was shown. On the third run the boat was given a most excessive passenger weight, 65 persons with a total weight of 9595 lbs. being carried. The motors were kept at the same speed as on the first two runs, the idea being to find out just how much the boat would decrease in speed with this abnormal overload without any extra horse power being used. The resulting speed of 31.03 M. P. H. under these circumstances is amazing, and undoubtedly constitutes a new record in the point of carrying a great amount of extra weight with no additional power, and with very little sacrifice of speed.

The fuel consumption is remarkably low considering the great amount of weight being carried. The first fuel consumption tests were made with a light passenger load of 10 persons and a boat speed of 30 M. P. H. Under these conditions the total fuel consumption was approximately 69 gallons per hour. Increasing the number of passengers to 51 and obtaining the same boat speed of 30 M. P. H., the fuel consumption was 78¾ gallons per hour, making an increase in consumption of only 9¾ gallons to maintain the same boat speed of 30 M. P. H., although the passenger load had been increased by 41 persons.

Based again on the runs made at fixed revolutions, namely 1450 per minute it will be seen that by overloading the boat abnormally to the extent of 122 per cent., and that without increasing the horse power at all, that the decrease in speed was only 11½ per cent. Consider these points in relation to what would be accomplished with any other type of boat know today, and we can better understand the amazing performance of this new boat. Then consider further that this boat is carrying these abnormal loads with no apparent increase in draft over light load, and one can realize the wonderful possibilities that are opened in its development. The draft of the boat with its very heaviest load is only approximately 20 inches.

Several very unusual points are noticed in the operation of this boat; it is exceedingly easy to maneuver, its turning radius is very short indeed, and it could be handled at low speeds with the same ease that it can be handled at high speed. There is an entire absence of vibration, and sitting in the forward compartment passengers can talk in ordinary tones and make themselves clearly understood. At speed there is practically an absence of all wake, the boat having practically no following wake at all. This alone shows great possibilities in the use of such craft in canals and narrow rivers, where boats throwing the customary large waves would wash away the banks.

(Continued on page 60)

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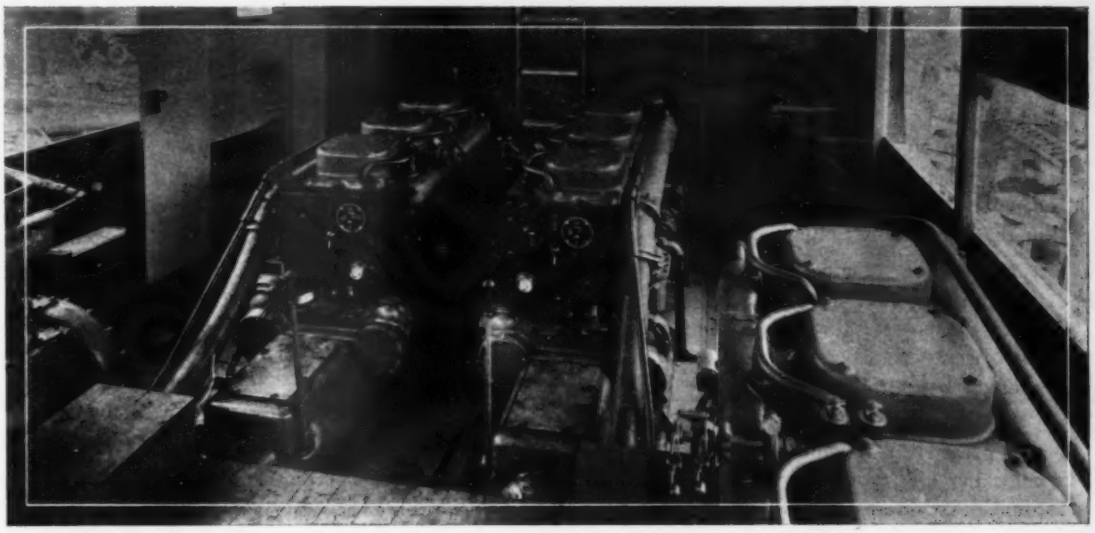
Sterling

THE ENGINE OF REFINEMENT FOR THE FINEST BOATS THAT FLOAT



FOUR of the DOLPHIN Model 6 cylinder STERLING engines which propel the Sea Sled LUZ at over 30 miles an hour with 65 passengers aboard.

The success of this Sea Sled is of National importance to Colombia. The country is almost impassable. The officials of the nation were back of the movement to make the interior accessible. Quick dependable means of travel was imperative and only such equipment that assured dependability and express speed was considered.

Thus STERLINGS were chosen. Because the project HAD to be successful. A marine express train, with engines that cannot be changed at each division, but which must keep going, daily, with only such attention as you would give a motor car.

The promoters chose STERLINGS to assure the success of their investment.

The Sea Sled Co., recommended STERLINGS because they had tried practically every adaptable engine in the country and they KNEW. This was their first chance to prove the Sea Sleds for just this kind of remote transportation. It meant the expansion of their business. Much depended on this boat, and they wanted STERLINGS.

Four 5¾" bore six cylinder STERLING engines, total 900 horsepower, every engine, every accessory, starters, spark plugs, oil coolers—working perfectly. Built to stay, practically vibrationless. Developed in four years to function properly and keep at it.

When you take your family, and your friends, aboard your yacht, will you be able to say, like the New York promoters and Official Colombia and the Sea Sled Co., that you bought STERLINGS because you wanted to be SURE

6 cylinders 225 horsepower $4000.00

STERLING ENGINE COMPANY 1254 Niagara Street Buffalo, N.Y. U.S.A.

Inverted V-bottom and Surface Propeller Boats.

SEA SLED

Hickman Patents in all countries.

Trade Mark Reg. U. S. Pat. Off. Trade Mark Reg. Canada.

Two Weeks Cut to Two Days

A Revolutionary Advance in Transportation Methods

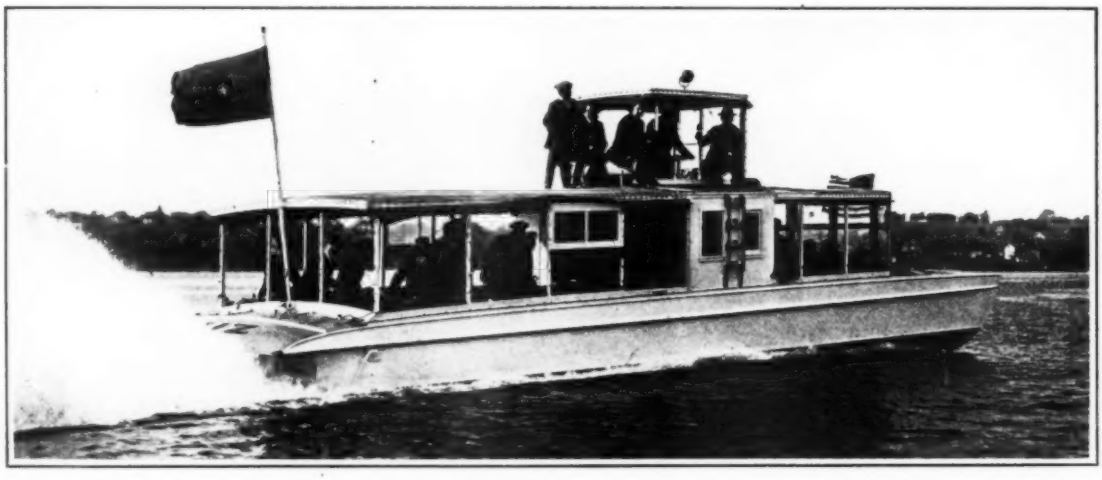
BUILDING a 500 mile railroad through South American hill and jungle country in a few months time may sound like an impossible accomplishment, but that is practically what this company has been asked to do in producing the passenger Sea Sled LUZ just delivered for use in the republic of Columbia.

The shallow Magdalena River takes the railway's place and the Sea Sled is a first class passenger train, making over 30 miles an hour with all the comforts of a Pullman. The 560 mile trip between the port of the inland capital, Bogota, and the nearest seaport, Barranquilla, is thus made with twenty passengers and a ton of baggage in two days, instead of two to three weeks by river steamer.

This boat inaugurates a new era in transportation methods for partially developed countries with great river systems. It is one of the most notable achievements of any motor driven craft, unlocking vast stores of wealth which have been inaccessible for lack of adequate transportation. Similar conditions requiring similar transportation will be found in every continent.

This achievement is only possible with a Sea Sled. No other type of boat could meet the requirements of such service. Shallow draft to navigate the shoal waters,—a fast boat to negotiate rapids and ride the current with the speed of a railroad train,—perfectly controlled at any speed to follow narrow channels or avoid floating obstructions,—great capacity for passengers and cargo,—economical operation insuring commercial success,—dependability for regular schedule.

No other boat could meet half of these requirements as well as the Sea Sled meets them all. She has in every detail on official trials exceeded the builders' guarantee—in speed, fuel economy, and passenger carrying ability.



LUZ, 20-passenger mahogany Sea Sled, 50′x 12′ drawing loaded at speed less than two feet. Powered with four Sterling "DOLPHIN" model motors totaling 900 H. P.

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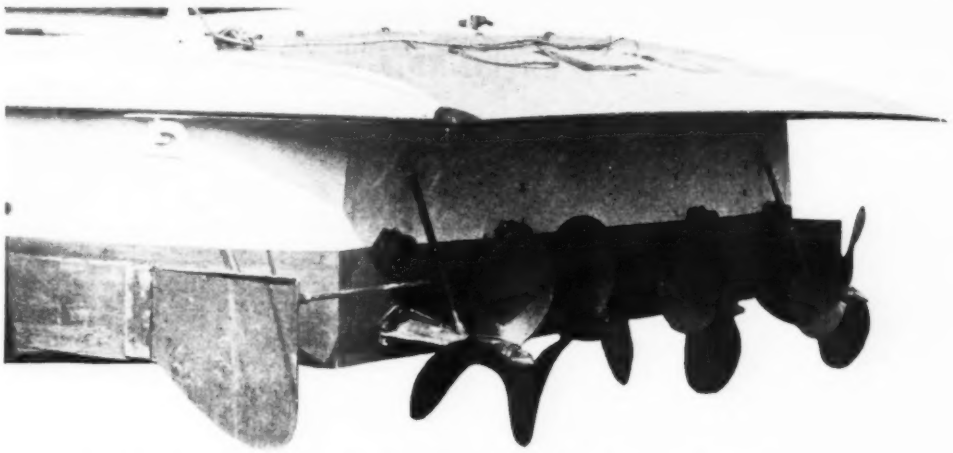


Showing in detail the four strong surface propellers that drive LUZ 35 miles an hour, and the two side-plate rudders which control her perfectly at all speeds. Surface propellers and side-plate rudders are exclusive Sea Sled features, patented in all countries.

A Remarkable Boat for a Remarkable Service

AS a boat the LUZ is as remarkable as the service she is designed to perform. With the highest quality of workmanship, material and equipment,—with greater passenger and cargo space, and several times the load carrying capacity of any other type boat of its size and speed, we have perfected a design in the hull which establishes an entirely new standard in boat efficiency. Even previous Sea Sled standards have been outdone.

Consider the efficiency in speed and weight per horsepower. The average 30-mile V-bottom speed boat has a weight of approximately 25 pounds per horsepower. Contrast with this the official trial records of LUZ which showed double this efficiency.

On the first trial run, carrying 27 passengers the weight of the boat and load was 35,320 pounds. The four motors turning 1450 r. p. m. gave a total of 800 h. p. This figures 44.25 pounds per h. p. and a speed of 34.61 miles per hour was obtained.

Still using 800 h. p. on the second run carrying 48 passengers the total weight was 37,815 pounds or 47.25 pounds per h. p. Speed on this run was 32.93 miles per hour.

On the third run with 65 passengers the total weight was 40,595 pounds, or 50.75 pounds per h. p. Speed 31.03 miles per hour.

LUZ was guaranteed to carry 20 passengers and baggage (5500 lbs. load) at 30 miles per hour. It actually carries 4320 pounds load (27 passengers) at 34.61 miles per hour—6815 pounds load (48 passengers) at 32.93) miles per hour—9595 pounds load (65 passengers) at 31.03 miles per hour. Note especially that the increase of 122% in usable overload caused a decrease of only 11½% in speed with the same h. p. and r. p. m.

Traveling 30 miles per hour with 10 passengers, a boat and passenger load of 32,500 pounds, the fuel consumption figured 69 gallons per hour. Traveling 30 miles per hour with 51 passengers the fuel consumption was at the rate of 78¾ gallons per hour. In other words an increase of 410% in passenger load caused an increase of only 13% in fuel consumption.

This means 1/20th gallon of fuel per passenger mile with 51 passengers, and less than ¼th gallon per passenger mile with ten passengers. With the normal load of 20 passengers the fuel consumption is approximately ⅛th gallon per passenger mile or eight miles to the gallon per passenger.

What more convincing proof could you ask to show the correctness of Sea Sled principles? Inverted V-bottom hull, surface propellers, side plate rudders—these Sea Sled fundamentals mean a better boat, no matter what the service required. A weedless shoal-draft boat, fastest for its power, most seaworthy, dry and free from flying spray, greatest load capacity, economical in fuel, easy to manage. What more can be asked in a boat?

Let us tell you more about* SEA SLED *principles and* SEA SLED *successes. Mention size and type in which you are interested. We build all sizes from an 8-ft. dinghy up.

The Sea Sled Company, Ltd., West Mystic, Conn.

Blistering Sun
Torrential Rains
Tropical Dampness
The Crucial Test of Good Paint

We are proud of the selection of Kirby Paints for use on the topsides, decks and superstructure of the Sea Sled LUZ. No boat ever built has presented such a test of paint quality and durability; for it must endure constant exposure to the severe tropical climate, 365 days a year.

The Sea Sled Company are experienced in building and finishing fine boats for extraordinary purposes. They know boats, motors, accessories, paints. They know South American weather conditions. They know Kirby Paints.

PICK KIRBY MARINE PAINTS FOR THE HARD JOBS

Outside White Flat Yacht White Inside White Enamel White Imported Holland White Enamel
Deck and Floor Paints Anti-Fouling Bottom Paints in Green, Red and Brown
Ready Mixed Paint, 24 colors

Write today for color card and prices.

Sold by the best marine dealers.

Geo. Kirby Jr. Paint Co., New Bedford, Mass.

COPPER EXHAUST PIPES FUEL AND WATER TANKS

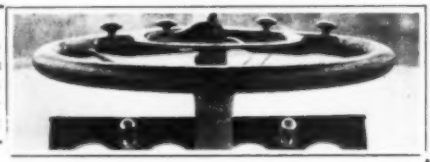
Copper is the only suitable material for these parts on motor boats. Lightest in weight, greatest durability, non-corrosive, free from trouble Saves money in the end because it never needs replacement.

We supplied the special copper exhaust pipes and gasoline tanks for the LUZ because we have served the makers of Sea Sleds for many years. They know the quality of our work.

Let us quote on your requirements.

BOSTON COPPER WORKS COMPANY
COPPERSMITHS
84 Marginal St., East Boston, Mass

Reliance Control on the Sea Sled "LUZ". A quality product on a quality boat.



Reliance Steering and Engine Controls

REGULARLY used by leading boat builders as standard equipment on stock models as well as special equipment on thier finest productions. We make a wheel for every type of boat. Unexcelled in design, construction and finish; right in price.

Vertical Cruiser Gears Inclined Auto Type Controls
Watertight Bridge Deck Reverse Gear Controls
Combined UnitControls Electric Clutch Controls
Sole Manufacturers of Patented Scored Drum Steering Wheels
Write today for catalog and prices

W. S. HALL CO., Rochester, N. Y.

Sea Sleds in South America

(Continued from page 56)

In the engine compartment are installed four of the Sterling 6-cylinder Dolphin Model motors, each connected to its own individual surface propeller. A Delco electric generating and lighting set with its batteries provides illumination and the current for the operation of the electrically driven gasolene pumps supplying fuel to the motors. The motors have been staggered in their installation, the two center motors being located at the forward end of the engine room, and the two wing motors at the after end. This allows plenty of room around each motor providing accessibility for the care of the engines themselves. A toilet is also provided in the engine room for the use of the crew.

The pilot is located in a protected pilot-house placed above the forward compartment and the engine room. Mounted on top of the steering column are the four spark and throttle controls, one set to each motor, the throttle controls being mounted on top of the quadrant and the spark controls beneath. In this way the operation of the boat in its control by the throttles is made very simple. The reverse controls of the two wing motors are led up to this pilot house, and the boat being maneuvered around docks, etc., is handled entirely from this pilot house, the two wing motors only being used in this work. When the boat gets under way the two center motors are shut down in. Thus, it will be seen that only a crew of two men is needed for the operation of this boat.

Also, in the engine room there are provided benches and lockers for the storage of parts for the making of minor repairs. The engine room itself is very ingenious in its arrangement.

Aft of the engine compartment there is a space for the carrying of the baggage of the 20 passengers.

Realizing that although a Sea Sled has remarkably little strain and stresses upon its hull in its operation, still the demands of this work necessitated an exceptionally strong boat, one that would stand very unusual strains. The hull is generously and strongly timbered with oak, and the planking is of three layers of mahogany, two layers being laid diagonally and one fore and aft. A layer of canvas is laid in marine glue between each two layers of planking, and the riveting and fastenings are very closely spaced. The result is a hull that is absolutely tight and exceedingly strong.

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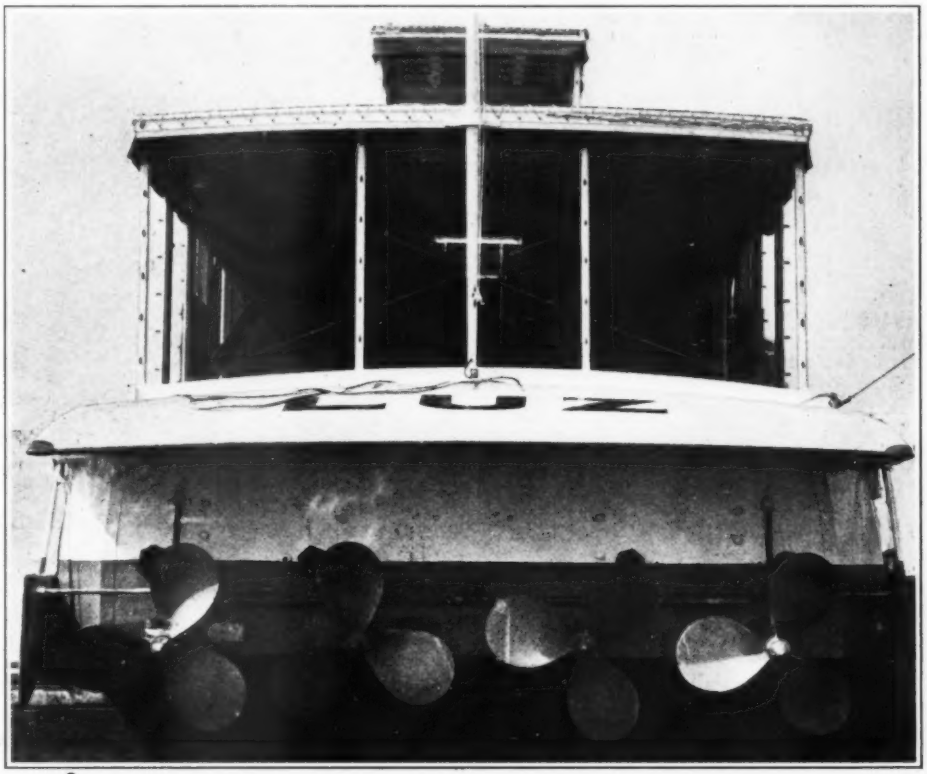


THE FOUR BIG SURFACE-TYPE HYDE PROPELLERS SUPPLIED BY HYDE WINDLASS COMPANY FOR THE TWENTY PASSENGER SEA SLED "LUZ" BUILT FOR TRANSPORTES RAPIDOS FLUVIALES OF COLOMBIA, SOUTH AMERICA BY THE SEA SLED CO. OF WEST MYSTIC, CONN.

HYDE PROPELLERS

are regular equipment on Sea Sleds. The selection of HYDE wheels by the Sea Sled Co. is a splendid tribute, as surface propulsion demands the utmost in efficiency of design and excellence of material and workmanship. These are inherent qualities of the HYDE.

--o--

On every other type of craft as well, HYDE wheels are rendering that efficient, reliable service that has earned for them an enviable reputation—a reputation acquired through years of consistent performance.

--o--

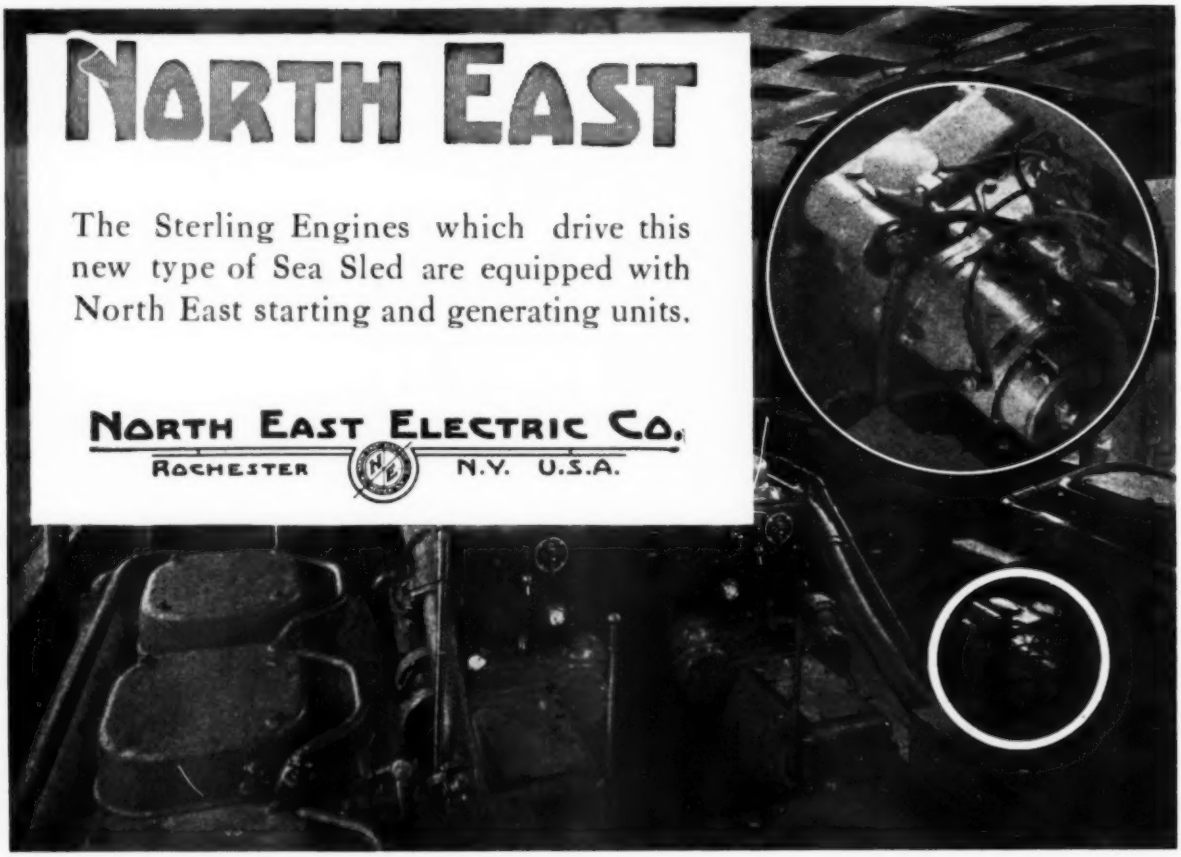
Our booklet "Propeller Efficiency" contains an interesting treatise on propellers in addition to our price list. We will be pleased to mail you a copy on request.

HYDE WINDLASS COMPANY, Dept. B, Bath, Maine.

NORTH EAST

The Sterling Engines which drive this new type of Sea Sled are equipped with North East starting and generating units.

NORTH EAST ELECTRIC CO.
ROCHESTER N.Y. U.S.A.



ECLIPSE
BENDIX DRIVE

THE starting gear transmission used on all four Sterling Engines in the the Sea Sled LUZ is a special type of Eclipse-Bendix Drive especially designed for large Marine engine installations.

The Eclipse-Bendix Drive is not only in practically universal use as the automatic engaging and disengaging transmission between the starting motor and the engine in automobiles, but also in its various standard and special forms is particularly well adapted for utilization on Marine engine installations of all types.

ECLIPSE MACHINE COMPANY
ELMIRA, NEW YORK

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The powerful Sterling-built engines of the incomparable Sea Sled "Luz" are equipped with Westinghouse Batteries.

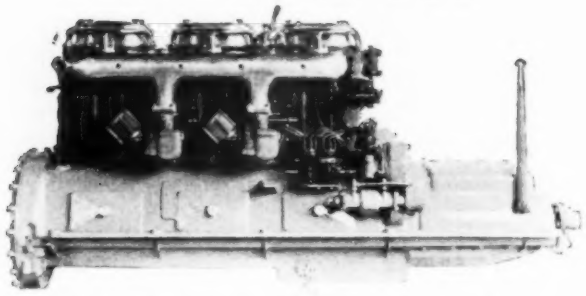
Westinghouse Union Battery Co.

Swissvale, Pa.

WESTINGHOUSE BATTERIES

Built by Westinghouse — you know they're right.

Sterling Engines Have RICH VALVES of Course!



RICH VALVES are world known as the standard valve for internal combustion engines.

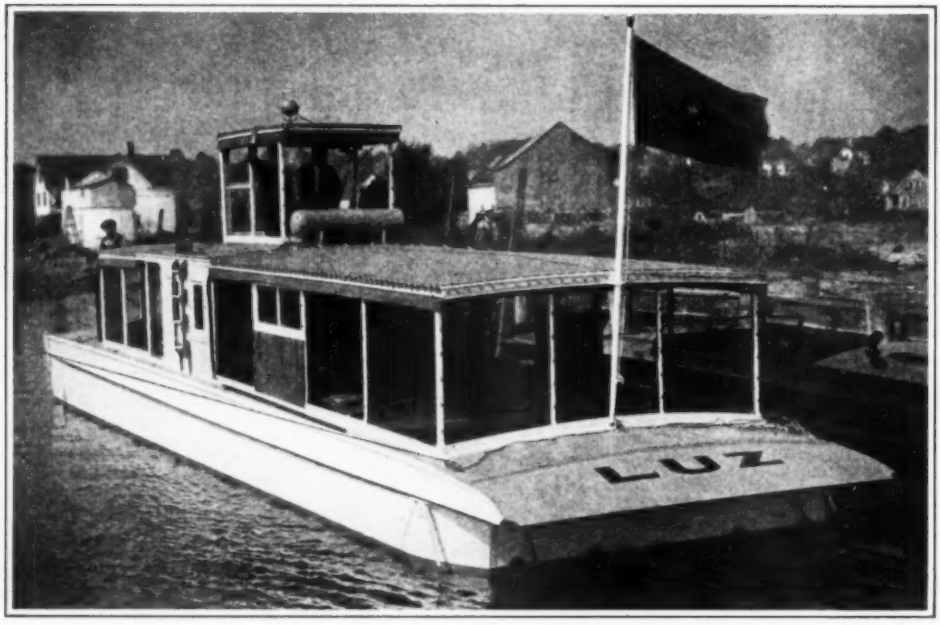
RICH TOOL COMPANY engineers and metallurgists consult with those desiring the benefit of their experience regarding design, alloys and heat treatment.

RICH VALVES are standard equipment on the majority of high grade marine, truck, tractor, airplane and automobile engines.

All genuine Rich Tool Company valves have stamped on the head the word "RICH".

RICH TOOL COMPANY

Railway Exchange Building **Chicago, Ill.**



The four six-cylinder Sterling Engines in the Sea Sled Luz have ninety-six Rich Valves—two inlet valves and two exhaust valves in each cylinder. Rich Chrome Nickel Steel Valves are used for the inlets, and Rich Cobalt Chromium Valves for the exhaust. The Sterling Engine Company states that engines examined after 6000 miles service at 1200 to 1750 R.P.M. show the valves absolutely tight, requiring no attention

Advertising Index will be found on page 110

V3015 NOV

Baby Gar III, one of the standardized Baby Gars. Winner of Fisher-Allison Trophy Race at Hamilton, Ontario, August 1922.

Baby Gar III Wins Fisher-Allison Trophy Race

IF any confirmation is needed of the merits of the standardized 32 ft. Baby Gar runabouts, ample proof is found in the performances of several of these boats at the season's biggest race meets—the meets at Hamilton, Detroit and Buffalo. Exact duplicates except as to power plants, three different Baby Gars proved themselves the fastest boats of their class on the water to-day.

Baby Gar III won the famous Fisher-Allison Trophy at Hamilton, taking first place in all three of the 50-mile heats and defeating the biggest field that ever ran in this event, including boats powered with all the well known makes of high speed marine motors. Average speed for the 150 mile race was 40 M.P.H. and the best lap was run at 46.5 M.P.H. Second place went to Packard Baby Gar, powered with a 12-cylinder Packard marine motor.

In the Wood-Fisher Trophy Race at Detroit, Baby Gar II powered with a 12-cylinder 450 H.P. motor took first place while second place again went to Packard Baby Gar. The best lap for Baby Gar II was 51.5 M.P.H.

At Buffalo, Baby Gar II repeated her performance by winning first place in the 2200 cu. in. displacement boat class, with a speed of 50.8 M.P.H. in one 30-mile heat and a speed of 53 M.P.H. for the best five mile lap.

Remember, Baby Gar is not exclusively a racing boat but is built for practical runabout use, with seating capacity for eight persons. You can buy a duplicate of the above boats with guaranteed speed according to power and full guarantee covering every other detail of hull and power plant. Furnished complete, fully equipped and ready to run.

50 Miles Guaranteed

$8250 (Tax Paid)

Powered with a 450 H. P. Liberty Marine Motor. (1550 cu. in.) Speed guaranteed on 50 mile trial.

45 Miles Guaranteed

$7250 (Tax Paid)

Powered with 300 H.P. Motor (1350 cu. in.) Speed guaranteed on 50 mile trial.

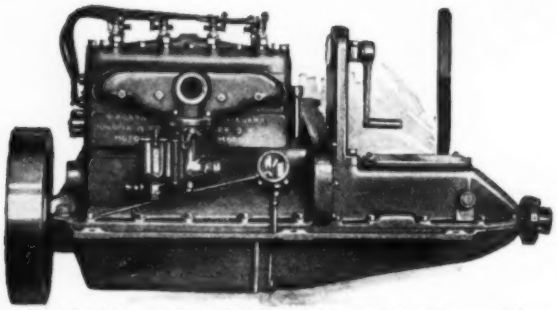
Write today for full details and delivery dates.
Attractive proposition for dealers.

Built by GAR WOOD, Inc.

Offices: 7960 Riopelle St., Detroit, Mich. Boat Building Plant, Algonac, Mich.

N. Y. Territory Representative and Service Station, Caleb Bragg, Port Washington, Long Island. Phone Port Washington 257

Chicago Territory Representative, Webb Jay, Standard Oil Bldg., Chicago, Ill.



NIAGARA "Special" 9-15 h.p. Unit Power Plant

The Ideal Power Plant for Small Boats

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Write today for catalog and prices.
Valuable Territory Available for Marine Engine Agents.

Niagara Motors Corporation

206 Niagara Blvd., Dunkirk, N. Y

Along the Jungle Trail

(*Continued on page* 16)

Manuel she had only a look and a shrug of her black shoulder. Drawing a Singer sewing machine from a corner, she up-ended a gasoline case and signified her supreme indifference to Manuel by sewing on some article of clothing.

Pausing long enough to sample ears of native sweet corn roasted before the fire we got under way along the last half mile to Manuel's clearing. The man explained as we went that his fellow townsmen called him a "damfool" for working so hard, but he couldn't have money without sweating and money he must have. Other "mans" might fish and live to eat, but he would sell his yams in Panamá in October for $400, buy soap, tobacco, clothes, and have plenty dollars.

He had certainly worked to clear this acre of its original growth. The stumps and partially burned branches of rubber trees, as well as the ashes of underbrush, showed that he had been mighty busy for at least two months in preparing his plot for seed. And now that the rambling vines of the yam and the melon, and the isolated stalks of rice were growing to maturity, there was still daily work to be done with the machete to keep the wilderness away.

If the choice were given me to lie under a cocoa palm all day and fish in the cool of the evening, or walk barefoot among prickly weeds, incessantly swinging a machete under the broiling sun, I think I should be among those who called Manuel a "damfool." But he was as proud of his growing things as any Long Island suburbanite is of his dinky kitchen garden.

When Manuel had hacked the stalks of a few weeds to satisfy his conscience—cutting the roots seemed not to occur to him—we returned to his hut, and Jo and I sat in the cool of the doorway to let events take care of themselves. We were ready to return to Hippocampus, but Manuel had not had his noonday meal and we made no effort to speed him up. The conversation among the negroes turned principally on the behavior of the *muchacho*, or boy, who had been surprised by Jo on the trail and had nearly died of fright. His face as he had run crying to his mother had been a perfect caricature of fear, and his elders mimicked him over and again, taking great delight in retelling the incident as the other field workers came in for lunch. It appeared that Jo was the first white woman the seven-year-old boy had ever seen, and that he thought there was something the matter with the color of her face.

As the minutes lengthened into an hour it became apparent that the meal was to be specially fine and that we were expected to share it. When this fact was understood from the actions of our hosts we bubbled over with protestations. We had no objection whatever to eating with our companions of the day, coal-black though they were, but we knew in advance that their cooking would be unacceptable to the American palate. Moreover, I had seen in the large iron pot which was simmering over a log fire, the heads and feet of two chickens, and I could not tell just how far the thrift of the islanders went when it came to boiling poultry.

Say what we would about our lack of appetite, Manuel insisted that we share his hospitality, and when one of the women fetched a clean white rag for a tablecloth and another for a napkin, we knew that further refusal would wound all of them. Our acceptance gave Manuel opportunity to broach another subject which had been uppermost in his mind.

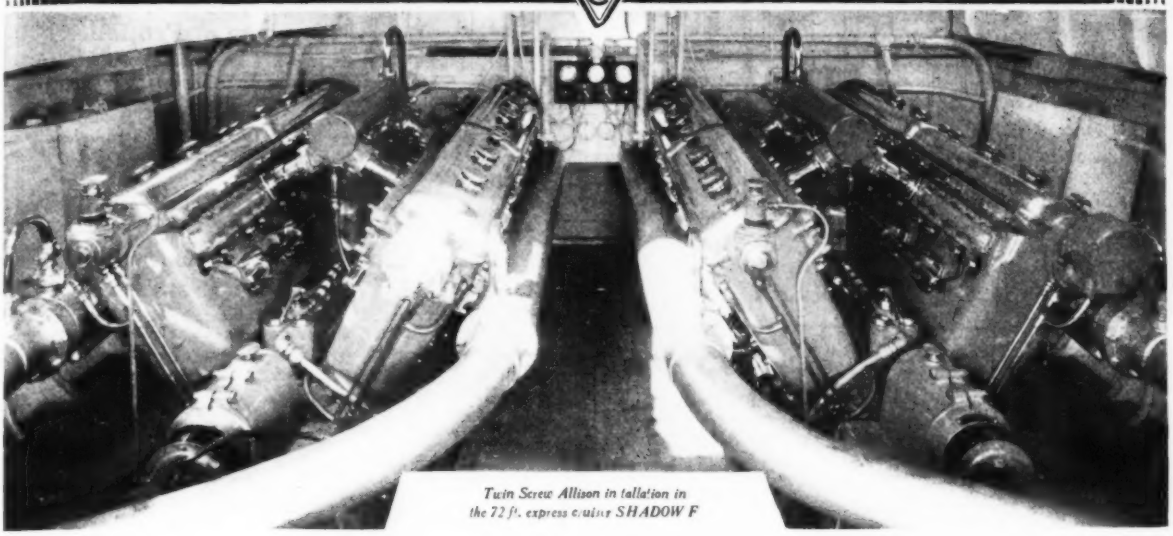
"The pictures," he said, pointing to my camera which had been leaned against the bamboo wall of his castle, "when they be ready?"

"Not until we get back to Panama," I said. "I no do work myself."

"Box no make pictures itself?" asked the negro, in disappointment. And I realized how pathetically ignorant and backward these people were. I had snapped Manuel in his doorway and on his clearing, and the camera had been sitting by itself in the shade for more than an hour; and, according to his reasoning, poorly expressed in English, any camera worthy of the name ought to be able to develop and print its own pictures in half that interval.

By the time I had explained in words that are similar in both languages—chemicals, paper, and so on—how involved the making of pictures is, dinner was announced. A small table had been laid for Jo and me with tin plates, one glass, and the necessary forks and spoons, and when soap boxes were placed before it, we sat down and ate. The others crouched on the floor around a wide wooden platter, and ate from plates filled and refilled from the cooking pot. Dogs and chickens roamed about at will, snatching for bones thrown to earth, and the family cat tumbled down from the rice loft overhead, landing square on the shoulders of a picaninny who was enormously occupied with a baked yucca root.

(*Continued on page* 74)



Twin Screw Allison installation in the 72 ft. express cruiser SHADOW F

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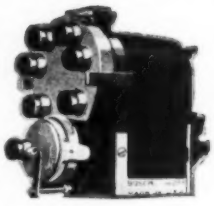

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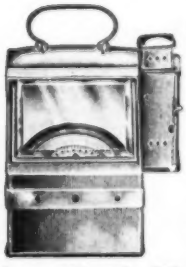

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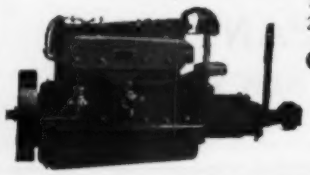

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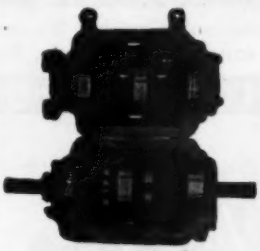

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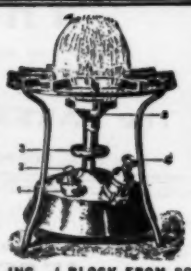

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BOAT SUPPLIES

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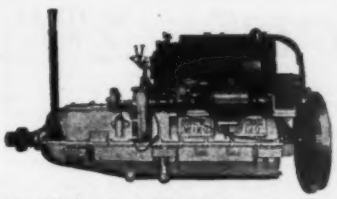

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400 to 500 R. P. M.
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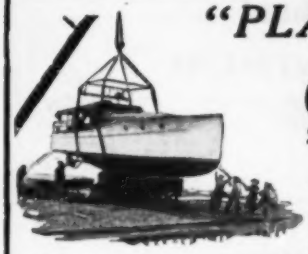

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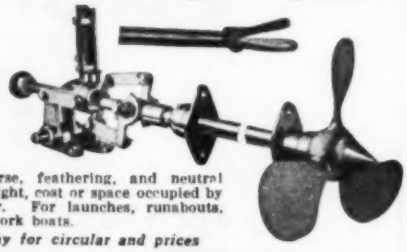

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THE J. H. CURTISS CO.

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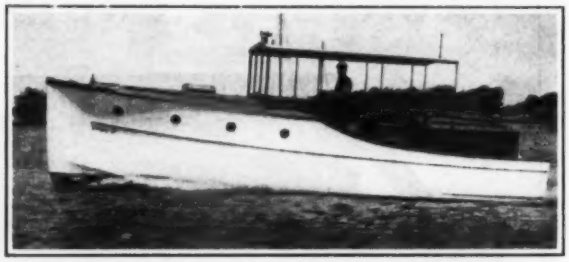

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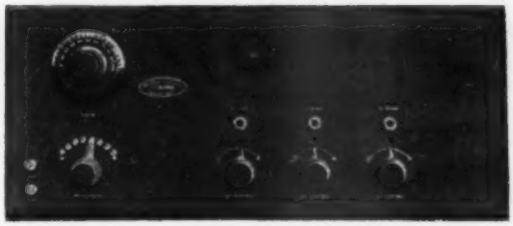

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A Quality Radio Receiving Set

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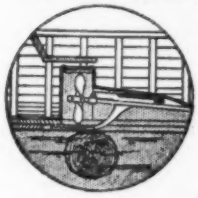

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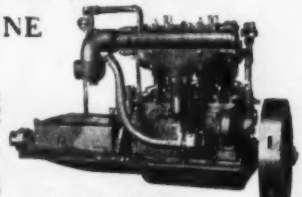

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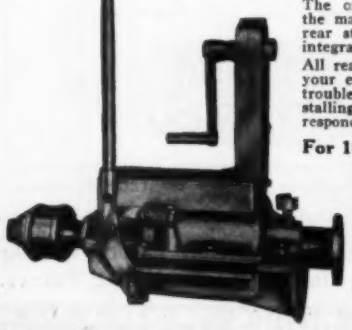

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Along the Jungle Trail

(Continued from page 66)

Our meal was more elaborate than the picaninny's, consisting of a greasy stew of chicken, yams, and cocoa root, and I must say for the food, that, difficult though it was to swallow it was clean. In fact, everything about the hut and its occupants was clean, from floor to clothes. This was in marked contrast to the personal habits of the inhabitants of Saboga, our first stopping place in the islands. Nevertheless, the experience was not one of unalloyed pleasure, as moths and butterflies fly over a steaming pot and we were glad when Manuel finished his meal and told us of his readiness to return to Cacique.

The walk back to the sea was made over a little used trail where Manuel knew that he could find sugar cane to take to his sweetheart in Mafafa. The going was not as good, but the distance was less, and it was not long before we were in the dinghy and then aboard Hippocampus.

Manuel accompanied us to Mafafa and in the late evening he, the school teacher, and twelve others of all ages and both sexes came out in a single cayuca. Manuel, in the assured manner that he had, signified his intention of taking the teacher and her friends for a moonlight sail on the Hippo, which he said in compliment was a "too pretty" boat. But I pleaded the lateness of the hour and the large number of his friends. Whereupon the whole party shoved off in high spirits, Manuel the richer by a pocket compass, which, of all worldly things, he probably has the least need, but which pleased him beyond expression.

On the day following we took up our sailing life, glad of our excursion into the bush, but happy to feel the heave of the sea beneath us again. The weather looked bad to southward, and as we crossed St. Elmo Bay, bound for the eastern side of Rey Island, the advance rollers began sweeping in from the Pacific. Mafafa was a good place to leave behind with the wind to southward, and we had in mind a land-locked cove behind a certain Canas Island.

The storm overtook us when we were still in open water, and flying before it under jib and jigger, Hippo felt her first touch of really rough going. We had left the mainsail furled to avoid complications, and had kept the motor running to get us in before dark, and the combination of small sails and power was exactly right for the occasion. As the storm clouds blackened behind us the white water swirled around us, and when it became necessary to change tack to reach our objective, we took the green over our bow in deep-sea cruising fashion.

At the end the wind was succeeded by rain, violent at first, and it was in a gentle downpour that we sounded over reefs and came to anchor in a sheltered pool which differed in configuration from the chart as nearly all the smaller locations of the vicinity do differ. However, it was protected from all winds, and barring a gentle whirlpool that put six turns of line around our anchor during the night, was perfect. The next day we reconnoitered the waters of Canas Island, avoiding rocks by the breakers over them, and trolling unsuccessfully for mackerel. Taking food ashore at the head of a sandy cove, we built a fire and ate a picnic lunch. There I made a momentous decision about the utility of paper plates.

Jo favors them as labor-savers and I had hitherto objected to them only on principle. I knew, of course, that they take up a lot of room and become mildewed when kept aboard for any length of time. As neither of these drawbacks seemed vital, Jo and I were in hearty accord when we stocked up with a cargo of them at Gatun. But when I found on the beach at Canas that my paper plate absorbed all the delicious juice of a corned beef stew I became irate. And when my fork went through the saturated plate and plunged all the beef to the sand I swore a mighty oath. I vowed that I would drink solids from a cup or inhale liquids from a nose bag, but that never again could I be induced to take victuals from a paper plate.

On the day following, when we were under way for the town of San Miguel, Jo made an equally memorable decision. Passing close to one of the isles which fringe the main island, I had been attracted by the sight of jumping fish, and had trailed a line with a small Pflueger spoon. A heavy strike (if that is the term fishermen use) and an escaped fish had convinced me that my tackle was too small, and I had replaced that spoon with a larger one. Followed five minutes of inactivity while we trolled back and forth beside the island, and then a vicious tug. For a minute or so it was a case of haul in or be hauled out, but by bracing my feet and putting my whole strength to the task I was able to take up slowly.

This was fishing de Luxe, and though I have little liking for the sport, I could see the satisfactory difference between a

(Continued on page 80)

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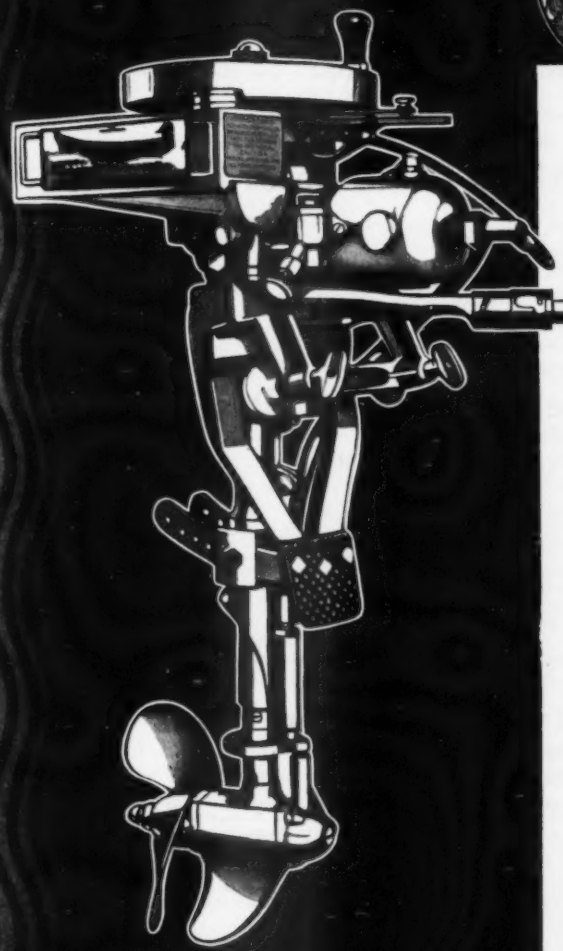

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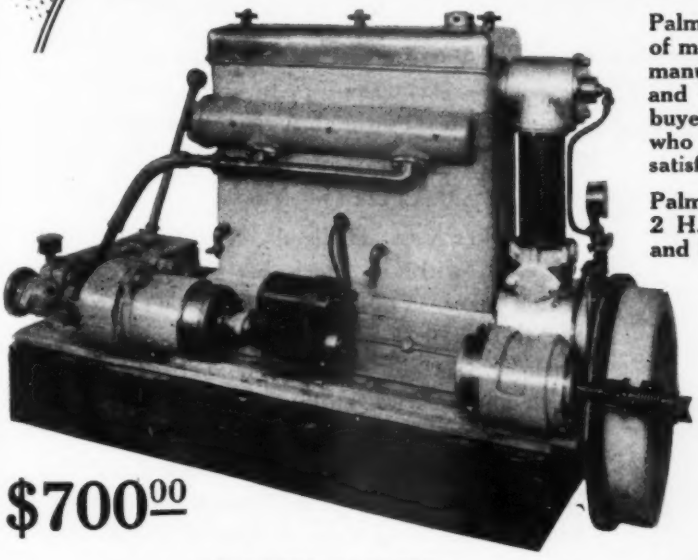
TRADE MARK REG. U.S. PAT. OFF.

Power Your Boat with a Palmer Engine



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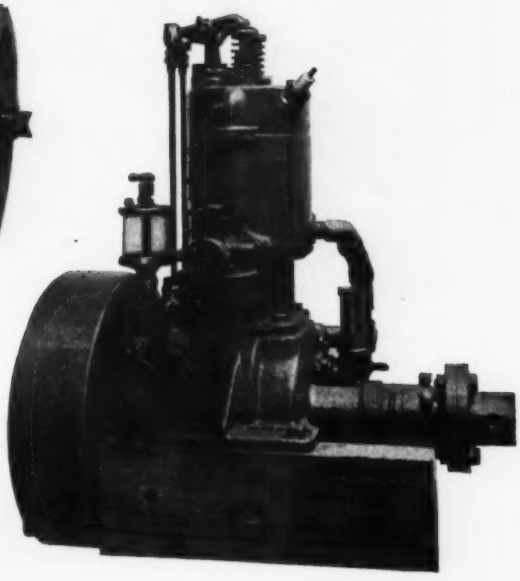

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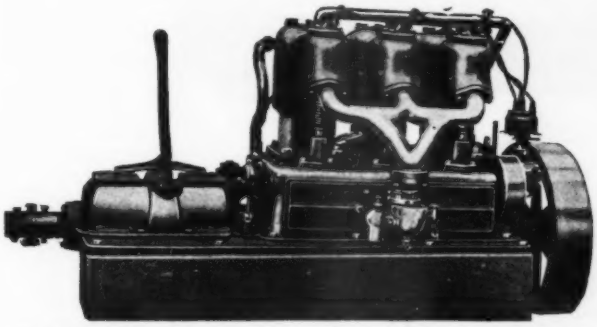

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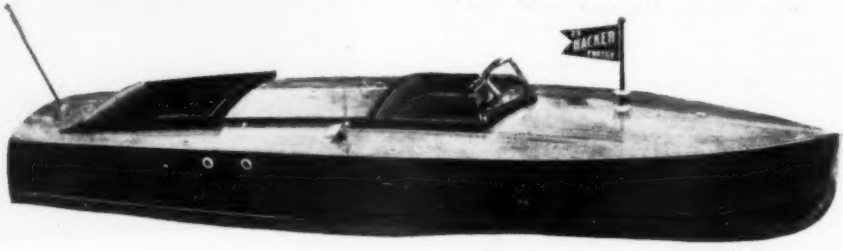

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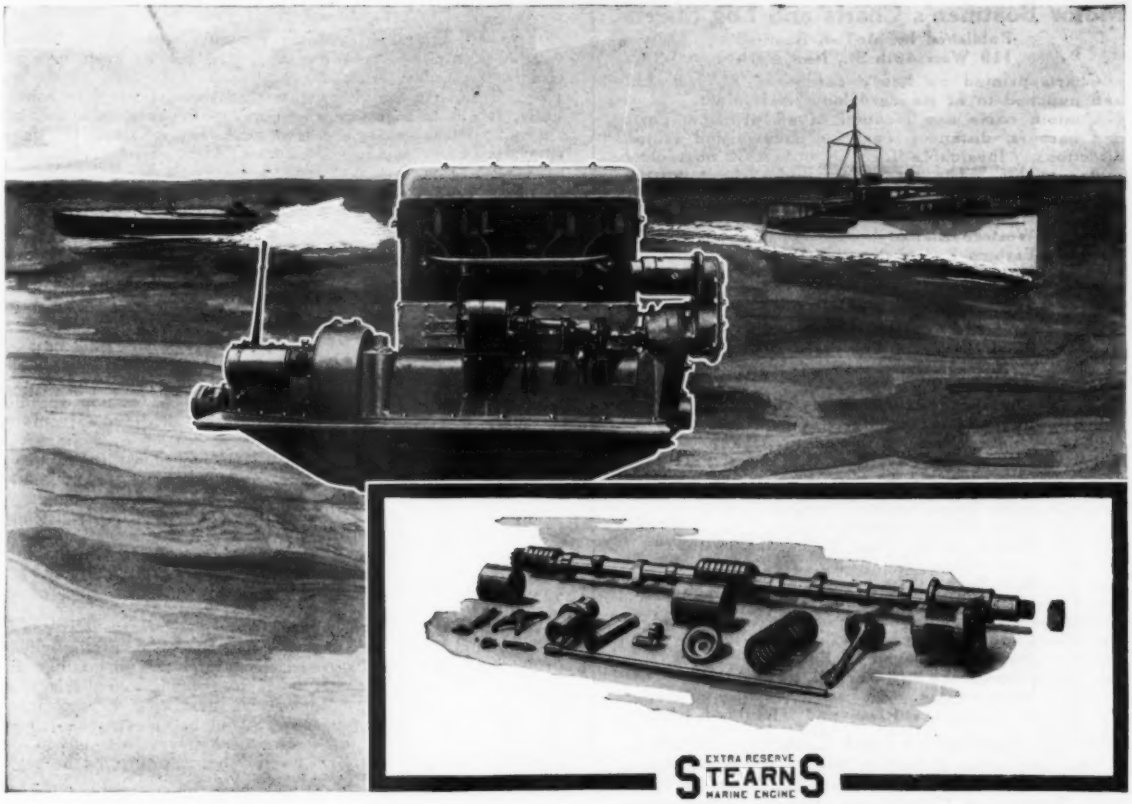

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No. 7—Block Island to Vineyard Sound, including Narragansett Bay.
No. 8—Delaware Bay.
No. 9—Chesapeake Bay, Part 1, Upper Part.
No. 10—Coast of Maine, Portland to Rockland.
No. 11—Hudson River, Kingston to Albany.
No. 12—Chesapeake Bay, Part II, Central Part.

Series B

No. 13—Lake Erie—Eastern Part.
No. 14—Lake Erie—Western Part.
No. 15—Hudson River, New York to Kingston.
No. 16—Lake Champlain.
No. 17—Erie Barge Canal.
No. 18—Massachusetts Coast.
No. 19—New England—Newburyport to Portland.
No. 20—Cape Cod Bay.
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No. 25 Nov., 1921..Delaware River, Trenton to Philadelphia.
No. 26 Dec., 1921..Delaware River, Philadelphia to Smyrna.
No. 27 Jan., 1922..New Jersey Coast, Cape May to Little Egg Inlet.
No. 28 Feb., 1922..New Jersey Coast, Little Egg to Barnegat Inlet.
No. 29—March, 1922. New Jersey Coast, Barnegat Inlet to Sandy Hook.
No. 30 April, 1922. Chesapeake Bay, Smith Point to Cape Charles.
No. 31 May, 1922..Potomac River to Lower Cedar Point.
No. 32 June, 1922..York and James Rivers.
No. 33 July, 1922..Delaware Coast, Cape Henlopen to Chincoteague Inlet.
No. 34 Aug., 1922..Virginia Coast, Chincoteague to Cape Charles.
No. 35 Sept., 1922..Virginia Coast Cape Henry to Albermarle Sound.
No. 36 Oct., 1922..Albermarle Sound, North Carolina.

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Charts 25 cents each or $1.50 per set of 12, 36 Charts for $3.50 (Series C will be sent as published). Log Sheets $1.00 per set of 50 Sheets.

Loose Leaf Binders (canvas bound) to hold Charts and Log Sheets, $1.75.

36 Charts, 50 Log Sheets and Loose Leaf Binder to hold Charts and Log Sheets, $5.00.

MoToR BoatinG
119 West 40th Street, New York

Along the Jungle Trail

(Continued from page 74)

gamey twenty-pounder and the minnows which have hitherto swallowed my hook. When I finally got the fish into the cockpit he occupied it to the exclusion of the rest of us, and Jo gave me her first intimation that she did not like fishing. Later, when we had identified our capture as a jack and had cut off a steak of red, coarse meat, she became even more emphatic in her opinion. Still later, when an odor reminiscent of Glousecter ascended from the galley stove, Jo announced that she would eat crackers and jam for supper. The episode ended when I touched a flake of the cooked fish to the tip of my tongue and heaved the whole mess overboard.

That concluded our fishing in the Pearl Islands. Where mackerel and other delicious kinds abound, we had the misfortune to catch a jack, and thereafter when I had an impulse to troll Jo said firmly, "You will have to clean, cook, and eat whatever you catch," and I stifled the impulse.

But of the other delights of sailing we had full measure. Unlike the first half of our cruise in the islands, the breeze came when we wanted it, and our nightly anchorages were undisturbed by the thought of dragging, or cutting the line on sharp boulders. Not always did the wind blow from the desired direction, but whether we were beating or sailing free, the unfolding panorama of the islands continued to be a joy.

For the most part, rising sheer from the water a hundred or two hundred feet, they are covered with a dense tangle of growth, but occasionally the shore line shows a strip of glistening beach, with perhaps a cocoa palm or two rising in silhouette against the sea beyond. Off to the east and south the high mountains of South America loom against the skyline, and among them clouds form, and lightning flashes in the evening twilight.

Where nature unaided by man paints the picture, it is one of many colors and varied beauties, but when, as in the village of San Miguel, the Pearl Islander builds his habitation, the observer looks askance and holds his breath. To this town we came on a sunny morning, and, anchoring in six feet a half mile from shore, prepared to land in the dinghy. Almost instantly, however, we were surrounded by natives, and in less time than it takes to tell it we had been persuaded to buy a dozen eggs, a dozen bananas, and half a dozen pearls. The last, because of their cheapness, deserve special mention.

The pearling industry in the islands has declined in recent years, but good gems are still brought up from the ocean floor and claimed by the Panamanians who hold the pearl concessions. Smaller ones, of imperfect roundness or lustre, stick somehow to the fingers of the negro divers, and these the visitor to the islands may pick up for a dollar or so apiece.

Though worth little in themselves, pearls bought in this way have a sentimental value, and our own small specimens have another, special quality. Unwrap them from their protecting layers of cotton, and they seem to be exactly what they are—untrue in shape and of the size of glass pinheads. Leave them alone for a week or two and they grow in size. The imagination gives them value, and Jo and I speak seriously of setting them in gold and platinum and startling the natives of the United States.

So much for the pearls: the town from which they came is invested with no such magic quality. In aspect and retrospect it is squalid, dirty, and ill-smelling. Of the white race, only an occasional French pearl buyer lives there, but the black race is represented by a thousand or so human beings, unnumbered hogs and chickens, and hundreds of parti-colored dogs.

The dwellings are of the thatched-roof type which we had previously seen in Saboga, or of wooden construction with roofs of corrugated iron. The church is in ruins, and only the graveyard, which seems to be well patronized, shows signs of other than casual, grudging care. A smell of fish fried in cottonseed oil, of meat drying in the sun, of mud rooted up by hogs, pervades the village, and in an hour's time drives the stranger back to sea.

Even if we had cared to remain longer in this ill-favored town, we should have been obliged by necessity to get away. For, for the first time in all of Hippocampus's wanderings, a water tank had been allowed to drip overnight, and we were dangerously close to our last ration. We had seen of the Pearl Islands what we had come to see, saving to the last its capital so that our first impressions might remain permantly pleasant, and now our attention was inescapably fixed on a return to civilization.

First, however, we touched the peak of perfect sailing. Motoring in midafternoon for an anchorage behind an island to northwestward of San Miguel, we met a breeze from that direction, hoisted sail, and decided to beat for Saboga. The setting sun, plus a storm brewing to leeward warned us to make a quick arrival, but the hum of the wind through the rigging and the chop-chop-chop of the dinghy towing astern invited further sailing. So, accepting the invitation of the

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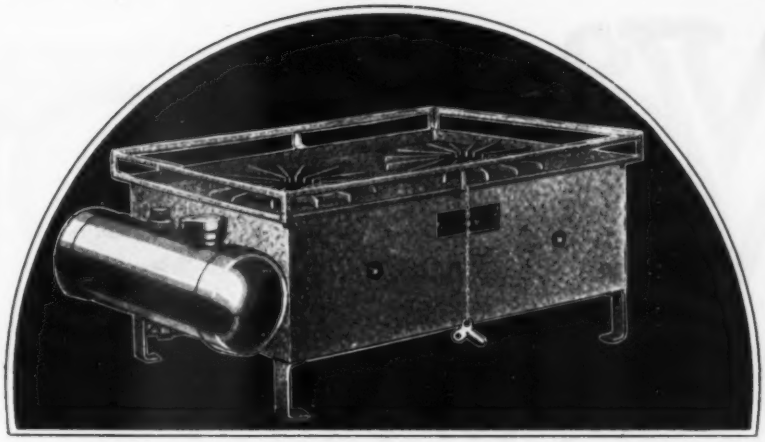


GALLEY-KOOK KIT

TRADE MARK

The practical and efficient galley stove for fresh and salt water craft

A REALLY practical gasoline stove for marine use. Built especially for galley use—efficient—occupies minimum space—made of the very best materials obtainable—economical to operate—perfectly safe under all conditions.

Auto-Galley-Kook-Kit is not an experiment, but a time tested product built by men who have been building gasoline stoves for years. Designed in accordance with ideas of several prominent motor boat owners and builders and pronounced by them as the best galley stove on the market.

Handled by all the leading marine supply houses in the principal Atlantic and Pacific Coast cities.

Specifications:

Size, 20¼" x 10½" x 5¼"; legs 2" high; body made of galvanized iron, strongly riveted; all fittings galvanized or of copper or brass; tank made of brass, carefully tested; has rail around top to prevent utensils from sliding off. Burns ordinary motor gasoline—gives a steady hot blue flame that a thirty mile wind can not blow out. Equipped with a full sheet of galvanized iron for covering of table or bench on which stove is mounted. Has slots for legs to fit into. Pump and funnel with each stove.

Price, complete, $20.00

If desired. Auto Galley Kook Kit can be furnished with the tank separate from the stove, and equipped with 15 feet of copper tubing so the tank can be mounted on deck.
Price, complete with 3 gal. tank, 10" pump. $32.50 Price complete with 1 gal. tank, small pump. $27.50

PRENTISS-WABERS STOVE CO.

General Offices and Factory
108 Spring Street, Wisconsin Rapids, Wisconsin

REPRESENTATIVES

Chicago, Ill.
Mr. W. Al. Treat, 190 N. State St.

Los Angeles, Cal.
Mr. H. M. Waterman, 1311 S. Figueroa St.

Dallas, Texas
Mr. F. H. Chown, 1121 Gasco Bldg.

Portland, Ore.
Mr. Geo. E. Vickers, 411 N. Mont Clair St.

Denver, Colo.
Sprake Sales Co., 304 Charles Bldg.

New York, N. Y.
Mr. Chas. G. Johnston, 98 Park Place

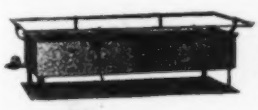
Canadian Boat & Engine Exchange, 43 Yonge St. Toronto, Ont., Canada

THREE BURNER MODEL

For those who wish a larger stove, we recommend the 3 burner model. Has three eight-inch grates and a tank; body size 30⅛" x 10¼" and 36⅛" x 14" over all, including rail and shut-off valve.

Price, with 1 gallon tank, pump and necessary copper tubing..$35.00.

The 4 burner galley stove has four eight-inch grates and is controlled by two master burners. Size, 22⅛" x 20½", and 28" x 24" over all, including the rail and shut-off valve.



All stoves sold with separate tanks are provided with a shut-off valve at the stove so that it is not necessary to go to the tank to shut off the gasoline feed.

AUTO-KAMP-KOOK-KITS

For those who wish a larger stove, we recommend the 3 burner moved from the boat and carried easily, the regular Auto-Kamp-Kook-Kits are offered. They are made in several sizes, from the One Burner Model to the Six Party Suit Case Outfit.

Auto-Kamp-Kook-Kit is made of sheet steel, strongly riveted, with a chocolate brown baked enamel finish. The tank is of polished brass, with pressure gauge, and fully tested. Has master burner and detachable key handle. Burns ordinary gasoline. A thirty-mile wind cannot blow it out.

Equipment shown in illustration consists of coffee pot, folding aluminum frying pan with cover, sugar and coffee containers. All the equipment packs inside making it as compact as a suit-case.

Price, complete with equipment..$15.50
Price, without equipment $13.50

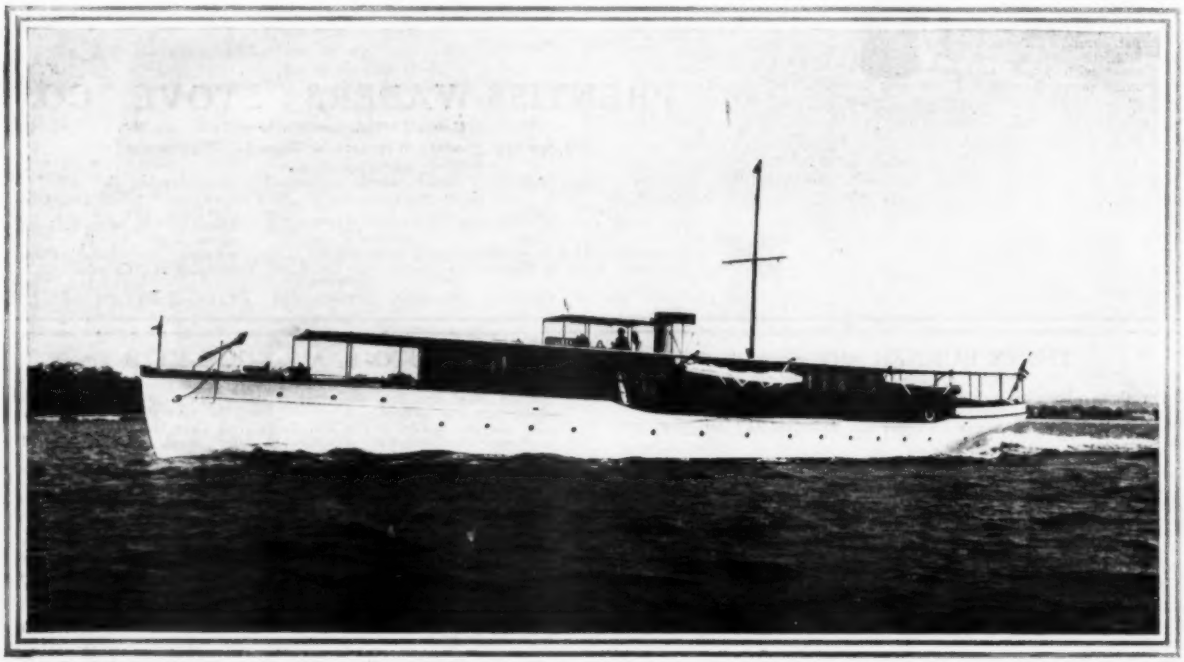
Winton

COLLEEN

Length: 110 ft. **Beam:** 18.2 ft. **Draft:** 6 ft.
Owner: Samuel A. Salvage, Port Washington, L. I.
Designer: B. T. Dobson, New Bedford, Mass.
Builders: George Lawley & Son Corp., Neponset, Mass.
Power Plant: A pair of six cylinder Winton Diesel Oil Engines rated at 135 H. P. each, designed and built by the Winton Engine Works, Cleveland, Ohio.

Winton Engine Works
Cleveland, Ohio, U. S. A.

New York City: A.G. Griese, Inc., 30 Church St. New Orleans: A. Baldwin & Company
Washington, D.C.: R.L. Fryer, 817 Alboe Bldg. Los Angeles: F. G. Bryant, 704 Delta Bldg.
Seattle: H. W. Starrett, Sunset Engine Co.



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Improved Yacht Construction

Sea-going yachts are undergoing a change which is bringing greater comfort and luxury to the owners.

In the modern yacht the propelling machinery is more compact and the additional space thus provided can be utilized in many ways—principally in increasing the number and sizes of state rooms.

The smoke nuisance is dispensed with by the use of gasoline electric propulsion and the greater cleanliness thus secured is a very desirable feature of this equipment.

None of the four units comprising gasoline electric drive are new—each is a thoroughly tried out unit proved by long usage on land.

This equipment permits of greater flexibility in the arrangement of machinery and when twin engine generators are employed greater dependability is secured.

Westinghouse engineers will be glad to consult with marine engineers and architects regarding gasoline electric drive for yachts.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Principal American Cities
Service Stations in Principal American Ports
Hunt, Mirk & Company
Special Pacific Coast Representatives
San Francisco, California

W WESTINGHOUSE ELECTRIC

Westinghouse

FOR MANY SEASONS
MOST IMPORTANT
TROPHIES
OF PRECIOUS METALS
HAVE BEEN DESIGNED
AND MADE BY

J. E. CALDWELL & CO.

PHILADELPHIA

JEWELRY-SILVER-WATCHES-STATIONERY

Next time you have to crawl out from under and get one more open-ender, remember this, A COES Wrench always fits, it always holds, and one of them will fit more assorted nuts than a double-handful of open-enders.

Ask Your Dealer

COES WRENCH COMPANY WORCESTER MASS.

Along the Jungle Trail

(Continued from page 80)

elements, we let out our sheets and ran to northward across the wind. Past Pajora, and saw a whale spouting in its lee, past Chapera and watched the breakers flashing in the waning light, past Cantadora, showing in bold silhouette against the western sky.

Then, when the distinguishing palms of Bartholomew bore dimly on our port bow, we came about and brought Saboga dead ahead. It was inky black by now, but first the deeper blackness of Contadora gave us our position and then a remembered tide rip to southward of Bartholomew. And then, along our bowsprit, we saw a light twinkle in the village of Saboga.

Now it was Down jib! to leave the fore deck clear for making up the anchor, and now Down mizzen! and now —Watch her, Jo, and head her up a bit; there's a reef to leeward. Steady as you go. Now, into the wind! . . . Right; the anchor's down in five fathom and you can lower your mainsail when ready.

So we finished our cruise among the Pearl Islands.

Buffalo Breaks Runabout Racing Records

(Continued from page 11)

and her best five-mile lap was 64.1 m. p. h., both of these, world's records for hydroplanes, powered with a single engine. In the Leary Trophy race, which for hydroplanes powered with motors of 1100 cubic inches or less, Miss Peerless, owned by E. L. Grimm of Buffalo, and powered with an 8-cylinder Peerless, won. Her best time for the twenty miles, was 26 minutes, 28 seconds, which is at the rate of 45.2 m. p. h.

The performance of Sayanora in the 1100 cubic inch and the 2200 cubic inch classes, deserves particular mention. Sayanora is a big 35-footer, powered with a 6-cylinder type of G R Sterling motor. She has accommodations in her cockpit to seat a party of eight or ten persons comfortably. In no sense is Sayanora an out and out racing craft yet she was able to follow very closely in the wake of boats much smaller, lighter, and with relatively more power than her own. A study of the times made by Sayanora, lap by lap is very interesting. In the second heat of the 1100 cubic inch class, her time for the six five-mile laps were as follows: 7:36, 7:36, 7:36, 7:36, 7:36, 7:35. No doubt the discrepancy of one second in the last two laps was due to the method of timing the boats which did not permit of splitting seconds. The other heats in which Sayanora started were nearly as consistent as the one noted above.

Nick Nack's performance also is worthy of comment. This boat was admirably handled by Commodore Ericson of Toronto and while not quite fast enough to win in her class, yet her performance was remarkably consistent and no engine trouble developed in the six races in which she started at Buffalo. As will be recalled, Nick Nack's power is a 6-cylinder, 200 h. p., Hall-Scott marine motor.

The usual set of efficient officials were in charge at Buffalo. Ralph and Clarence Sidway, held to their roles of masters of ceremony. Charles Alt, of the Buffalo Gasoline Motor Company, as Chairman of the Regatta Committee left no racing detail undone. Arthur Utz, as usual, was the social celebrity and very popular—especially with the ladies! Harry Elliott, Dr. Hubbard, E. G. Fox of the Sterling Engine Company, Will Grimm, and others, assisted in the handling of the boats, timing, etc.

Commodore S. B. Eagan's boat houses were used to house the contestants' boats and as always, his arrangements could not be improved upon, in fact, one of the most important features to which the success of all Buffalo regatta can be largely attributed, is Commodore Eagan's interest in the sport which has lead him to the development of his system of boat houses on the Niagara River. If it were not for these, not only would motor boat racing be impossible, but yachting of any kind not to be thought of. To Commodore Eagan's active co-operation, can be traced the development and improvement of motor boating in Buffalo during the last several years.

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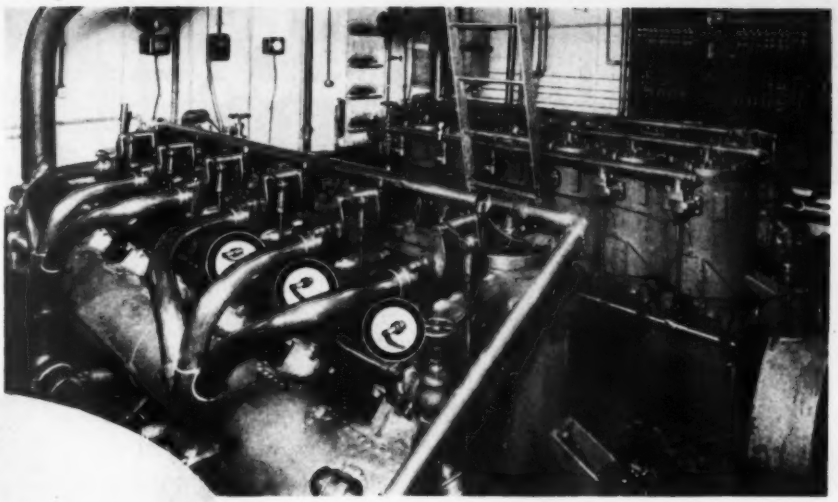
RAJAH
Equipped
of course



The handsome new 135-ft. cruiser "Alida" built for Bertram H. Borden of New York. Powered with two 6 cylinder 11" x 12" Speedway engines equipped with Rajah Spark Plugs.

RAJAH
SPARK PLUGS

For eighteen years Rajah Spark Plugs have been regular equipment on Speedway Motors, considered by many the finest marine motors made. For eighteen or twenty years and more Rajah Plugs have been used exclusively by many boatmen who were lucky enough to discover Rajah goodness years ago.

Why? You must buy them yourself to understand. When you discover Rajah quality nothing else will do.

Spark plug troubles in the aggregate mar the pleasures of thousands of boating hours. It is a little thing to cause so much annoyance, especially when you can buy immunity for the cost of one set of Rajah plugs.

Decide now to enjoy the utmost freedom from spark plug delays. Provide your motor with a full set of Rajah Plugs.

If your dealer doesn't sell genuine Rajah Spark Plugs, order direct from us stating thread wanted.

For fine boats and all others it's worth while to equip your spark plug cables with the famous Rajah Terminals. One Rajah Thumb Nut Terminal free with each Rajah Plug. Standard Rajah Terminals, 10c. each. Solderless Rajah Terminals, 15c. each.

Standard Rajah Plugs $1.00
Giant Rajah Plugs $1.25
Waterproof Rajah Plugs $1.25

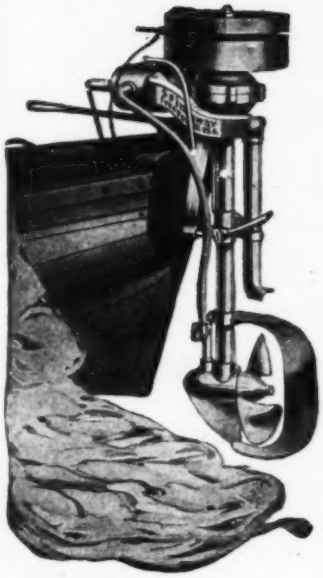
Rajah Thumb Nut Terminal

Manufactured by

RAJAH AUTO SUPPLY CO., Bloomfield, N. J., U. S. A.

Own a better Motor
at one-fourth lower Cost

A five-minute run will convince you that the Spinaway Detachable Row Boat Motor is a superior outboard motor. You'll discover that it starts surprisingly easy, and you'll find that it is a little giant for power. There's no power wasted in the Spinaway. The adjustable propeller shaft puts the propeller at just the right point in the water for best results. If you know fine workmanship and material when you see it, the Spinaway will take your eye at once. When you take it out for a spin, you'll know you are coming back on time. It is approached in workmanship and material only by the finest marine motors.



Spinaway Detachable Rowboat Motor

Built Right

- Has a Real Rudder
- Self Locking Tiller
- Under Water Exhaust
- Adjustable Weedless Propeller
- Automatic Tilting
- Protected Spark Plug
- Battery Ignition or Flywheel Magneto

$70.00

New low price on motor complete for battery ignition.

$80.00

New low price on motor complete for magneto ignition.

Runs Right

- Absolute Reliability
- Easy Starting
- Easy Portability (weight 52 lbs.)
- Perfect Safety
- Simple to Operate
- Fits Practically Any Row Boat
- Steady Flow of Power
- Finest Material and Workmanship
- Lowest in Price

A SIX YEAR TEST

"I have been using a Spinaway Motor for six years on my vacations throughout Michigan and Canada and it has certainly proved to be a dependable little outfit." — D. S. A. Pa.

"I wish to express my satisfaction as to the performance of the Spinaway Motor which I bought from you. It is easy to start, runs smoothly and has power equal to any of the outboard." — E. B. Ill.

"I received the Motor yesterday and gave it a try out. It runs like a top. Am very much pleased so far and had many admirers already." — J. E. Pa.

"Tried the motor out Sunday and it is all you claim for it. In fact it has more power and speed than the ———or——." — E. S. L. N. Y.

Names of parties giving these voluntary testimonials will be supplied on request.

Dealers We have an interesting, liberal sales plan. The market for outboard motors has only been "scratched." The Spinaway will meet any competition—price within reach of almost everyone. Your investment is small. Write for sales plan today.

Read this Liberal Guarantee

We unreservedly guarantee Spinaway performance and stand solidly behind every detail of its make-up.

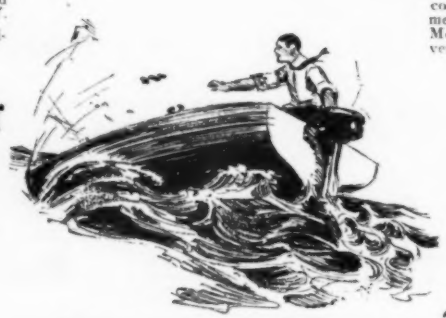
All Spinaway parts are interchangeable and we will replace free of charge any part which develops a defect due to faulty material or workmanship, or from any cause other than ordinary wear, neglect or abuse, provided such part is sent back to us transportation charges prepaid.

We are able to make this offer because in quality of materials, in character of construction and in perfection of mechanical adjustment, the Spinaway Motor is only approached in the very finest of marine engines.

Spinaway Boat Motor Company

Owned and Controlled by Hoefer Mfg. Co.

280 So. Chicago Ave.
FREEPORT, Ill.



Spinaway
Boat Motor Co.,
280 So. Chicago Ave.,
Freeport, Ill.

Send me full story and complete specification sheets of Spinaway Detachable Boat Motor. If interested in dealer proposition check here.....

Name .....

Address .....

Advertising Index will be found on page 110

QUALITY SNAP RINGS

"Last to Last"

Easy to Install
Quick Seating
Long Lived
Accurate

The number of QUALITY Piston Rings sold each working hour is sufficient to fully equip 1,000 motor boat and work boat engines.

This proves an appreciative response to QUALITY-SERVICE PRICE.

More Than a Million a Month

THE Piston RING COMPANY

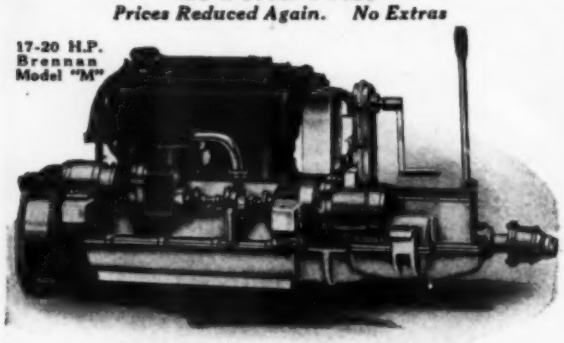
MUSKEGON, MICH.

A New BRENNAN

at a New Price

Prices Reduced Again. No Extras

17-20 H.P. Brennan Model "M"



Brennan Standard Motors Lead in Marine Value

The Brennan is a complete power plant with two unit electric lighting and starting system, and every other accessory built in. No extras required as our equipment embodies a complete outfit. This applies also to the Brennan Model B medium duty 25-35 H.P., and the Model B high speed type 35-40 H.P.

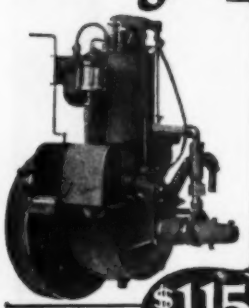
At our new reduced prices this completely equipped motor, including electric starter, costs you no more than an ordinary motor without equipment.

Write today for catalog and prices.
Order quick if you want early delivery.

BRENNAN MOTOR MFG. CO.

500 East Water St. Syracuse, N. Y., U. S. A.
Cable Address: "Binot"

Michigan Marine Motor



REPAIRS WITH FORD PARTS

MORE power, greater dependability, less weight, longer life, easier repairs, and lower cost—six salient points which make the Michigan Marine Motor the logical power equipment for your boat. Parts and repair service available at any Ford garage in the world.

Michigan Marine motor develops 4 h.p., weighs 125 lbs., is of 4-cycle type, and is fully guaranteed for one year. Equipped with Bosch Magneto and impulse coupling $30 extra. Built by Michigan Marine Motor Co. Write for special offer.

$115

Belle Isle Boat & Engine Co.
Builders of Belle Isle Motors
9061 E. JEFFERSON AVE., DETROIT.
Dept. B.

A Dugout Motor Cruiser

(Continued from page 25)

trations. These improvements brought the dimensions of the craft to 30 feet 2 inches length, by 4 feet 2 inches beam, by a draft of 24 inches.

When all was ready for the power, a two-cylinder 8 h. p. Caille (with Gibson adaptations) was installed on a lignum vitae engine bed; a sheet iron outboard rudder of the latest Gibson pattern was hung over the stern and connected with a steering wheel; the whole outfit floated on one of the 18-foot tides they have down in Balboa and the converted cayuca was a distinct success. Red says he makes 12 miles an hour with it.

Of course, it remained to put on the mahogany top and build an after lazarette to make the boat a complete cruiser; and in order to protect it from the Army workboats and other irrevitae around the sheer. Down in the Zone they use mahogany, cocobolo, and ebony just as we use old packing cases.

There isn't space here to mention all the handy little gadgets that Gibson has invented for his craft, but my story would be incomplete without a description of his home-made lubricator. This is installed in the lazarette and is permanently connected to the three main engine bearings and the shaft bearing. It consists of a length of hollow tubing, capped top and bottom, and provided with a central screw plunger. For operation it is filled with grease and the cap placed on and pressure applied to the plunger with a monkey wrench. Having nowhere else to go the grease flows to the desired bearing when one of four valves at the base of the plunger is opened.

The average man might not care to take the trouble to install a pressure lubricator of this sort, and he might not be able to if he did care. Gibson, however, has to have an outlet for his talent, and he takes as keen delight in temporary repairs as he does in permanent installations.

One night, for instance, when he was on his way to the bush to hunt, he burned out the lower half of a main bearing. The friend who was with him, hearing the resulting clatter, advised shortening the trip and hunting from where they were, but Gibson wouldn't hear of it. Taking his jack light, he stepped ashore and walked through the trees, underbrush, and water moccasins, looking for something. Presently, having used only his eye as a gauge and his knife as a cutting tool, he returned with what he had been looking for—a stalk of black palm which was exactly the diameter of his engine bearing. "Mikes" couldn't have measured the size more accurately.

He cut off a section to the length of the bearing, split the wood in half, scraped out the pith, and installed his wooden bearing. A few hours later the other half of the babbit burned out and it became necessary to stop and replace that also with the black palm. The feature of this experience that interests me most is not that Red continued running on the wooden bearing until he had time to pour babbit, but that he was able to cut the black palm with a penknife. Having had such small experience with this wood, I'd want a little TNT to do a thoroughly effectual job.

An Economical Oil Engine

(Continued from page 23)

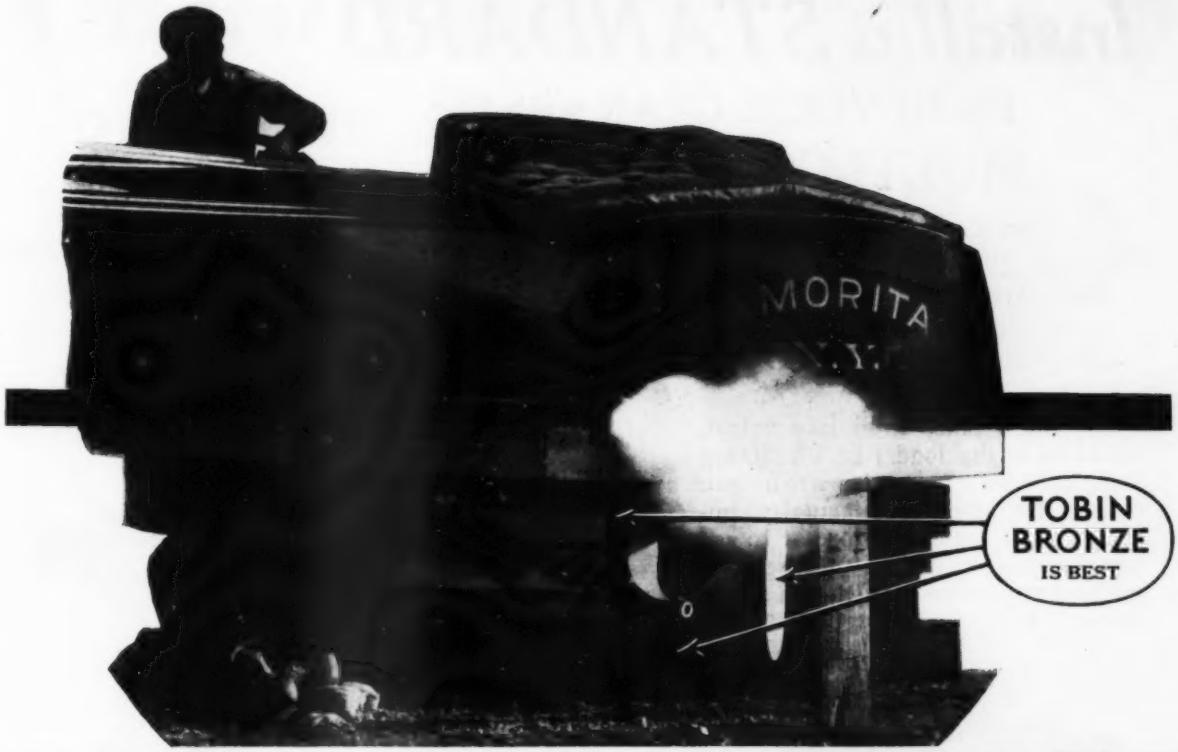
which the operator of an ordinary gasoline or kerosene engine can quickly become familiar. It operates on the well known four stroke cycle in which a full charge of pure air is drawn into the cylinder through a mechanically opened intake valve as the piston moves downward. On the upstroke with valve closed this air is compressed to between 320 and 350 pounds compression pressure. At a pre-determined point a portion of this air is compressed further and raised to a very high temperature in a specially designed chamber simultaneously with the injection of a small portion of finely atomized fuel. Instantaneous combustion follows with rapid expansion moving the piston downward on its power stroke. The exhaust cam opens mechanically and the burned gases are expelled in the usual way.

In cases where the engine is used at variable speeds the fuel consumption remains almost in direct proportion to the power used. Practically any low grade mineral or vegetable oil is suitable as fuel for these engines as they will operate with equal facility on any fluid oil. The bore of the cylinders is 8¼ inches while the stroke is 11 inches. At 350 revolutions 23 horse-power per cylinder is developed and any power range desired can readily be provided. One, two, three, or four cylinder sizes have been built and in cases where more power still is desired a twin screw installation will produce up to 190 horse-power.

The machines are equipped with an air starting outfit consisting of a small gas engine with an air compressor attached. An air tank is naturally required to store air for starting. It is a simple matter to pump the required air into the tank and the main engine will turn over before the maximum pressure possible has been attained. A separate series of cams operate the starting valves and the machine will take up its load very quickly using but a small volume of air. A heavy duty reverse gear is fitted in order to change the direction of the propeller and permit the engine to be run idle without turning the wheel. The construction is substantial and well proportioned. The engine is of pleasing appearance and due to its simple construction all parts are interchangeable. Especial attention has been given to the matter of accessibility and the entire working parts can be easily removed for inspection. Due to the fact that machines of this kind frequently are entrusted to inexperienced operators, much effort has been expended in rendering it safe and practically fool-proof. Typical of the proportions of the machine it might be mentioned that the crankshaft is of 4¾-inches diameter. The bearing surface for the crank is ample and in the case of the four cylinder unit consists of 58¾ lineal inches of bearing surface. The regulation of the speed of the machine is taken care of by a sensitive flyball type governor which controls the quantity of fuel delivered to the combustion chamber and maintaining steady running under all conditions of load.

For machines of this size the weight is not excessive. It will run slightly over 100 pounds per horse-power of the unit. In the case of the two-cylinder 46 horse-power machine the weight will be 6,700 pounds. The four cylinder machine of 95 horse-power will weigh 11,000 pounds.

Advertising Index will be found on page 110



CORROSION-RESISTING
TOBIN BRONZE

REGISTERED U. S. PAT. OFF.

Avail yourself of the first convenient opportunity to inspect the propeller shaft of your boat and all other underwater parts for traces of corrosion.

If there are signs of trouble don't hesitate but replace all corroded parts with Tobin bronze. This remarkable bronze alloy is preferred by experienced boat builders and naval engineers for such parts as propeller shafts, struts and steady bearings, propellers, rudders, rudder stocks, hull plates, centerboards, fin kels, fastenings, etc.

Because of its resistance to corrosion and tendency not to foul, Tobin Bronze is the only suitable material for salt water service. Its great smoothness and uniformity of texture make it easy to machine and permit a beautiful finish.

Write for descriptive booklet.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES, WATERBURY, CONN.

MILLS AND FACTORIES

Ansonia, Conn. Torrington, Conn. Waterbury, Conn. Buffalo, N.Y. Kenosha, Wis.

OFFICES AND AGENCIES

New York Philadelphia Boston Providence Pittsburgh
Cleveland Cincinnati Detroit Chicago St. Louis San Francisco

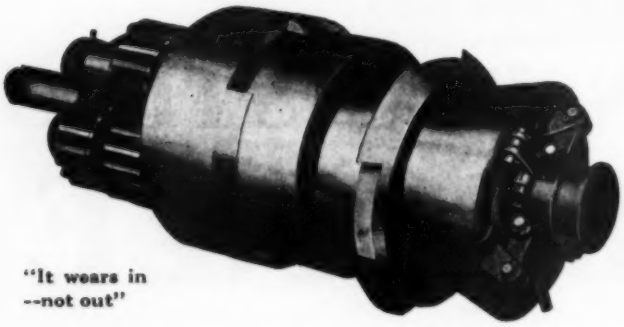
ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO, CANADA

Install a STANDARD

the REVERSE GEAR with the MULTI-CONE CLUTCH

There are other good reverse gears but there is no other gear with the MULTI-CONE CLUTCH, an exclusive Standard feature. Therefore no gear can equal the Standard because there is no clutch to equal the Standard MULTI-CONE.

This clutch takes hold like velvet, holds on to the load like a bull-dog and releases instantly when you throw the lever. It actually improves with use and is so easy to adjust that you can do it in a few seconds without any other tools than a screw driver.



"It wears in --not out"

The smooth engagement and tremendous holding power of the MULTI-CONE is due to its great friction surface. See the four large cones in the illustration and note that all the friction surface is at the point of greatest diameter, which increases the leverage and holding strength. These cones are much larger and sturdier than the thin plates used in a multiple disc clutch.

And then remember that the Standard is an all enclosed gear, running in oil. This reduces wear and noise to the minimum. The case is absolutely oil tight. A ball thrust bearing is built into the case. This gear is easy to install and is built to outlast your motor.

Write today for details and prices giving size and power of your motor.

Model "C" Standard Multi-Cone for 100 H. P. Hall-Scott Entirely Enclosed $100 COMPLETE

The Standard Midget
The smallest reverse gear made. Transmits ½ H.P. per 100 R.P.M. A real Standard with Timken roller bearings and Multi-Cone Clutch.

STANDARD GEAR CO.

2819 Brooklyn Ave., Detroit, Mich.

Advertising Index will be found on page 110

A Better Engine for Your Boat

A STRICTLY DESIGNED MARINE TYPE

Neat, compact, every moving part enclosed, you'll find the 1922 Gray as handsome and as efficient as any motor of its size ever built, regardless of price

THE 1922 Gray is neat in appearance, compact, and can easily and inexpensively be installed in runabouts 20 to 30 ft. in length; small cruisers up to 34 ft., also work boats.

Note the rigid one-piece base with Reverse Gear enclosed. The gear is automatically lubricated with positive gear pump that lubricates all other internal working parts of the engine—no grease cups or thick transmission oil used.

The splash lubrication is supplemented by force feed pump lubrication to all moving parts

Oil filler is conveniently located on *top of the engine* with duct leading to Crank Case. Rocker arm shaft is hollow and automatically supplies oil to Rocker Arms. Oil is forced under pressure to the three main bearings, and to the connecting rod troughs.

In brief, the Gray Oiling System leaves nothing to chance. It is unfailing at all engine speeds, and all oil is kept inside the engine, and not thrown around the boat or on its occupants.

The fly wheel is enclosed, affording safety and cleanliness. Bilge water cannot be thrown by the fly wheel. Every working part is enclosed; even the push rods. Due to the special design of the Cam Shaft, push rods and rocker arms, scarcely a sound can be heard with the ear close to the engine.

The smooth, quiet operation of the new Gray improved Valve-in-Head at all speeds from 200 to 2000 would compare favorably to an electric motor. It runs most economically on low grade gasoline and satisfactorily on kerosene.

Note The Big Crankshaft

The diameter of the main bearings are : Front 2⅛". Center 2 1/16". Rear 2". The lengths are 3⅜", 2½", 2½" respectively. Crankshaft is 40-50 point carbon steel forging, heat treated and ground.

Special attention is given to the balancing. The shaft is put in rotative as well as static balance on an Akimoff Dynamic Balance Machine, reducing vibration to a minimum.

Bosch Magneto with Impulse Starter, also Bosch two unit Starter and Generator is used.

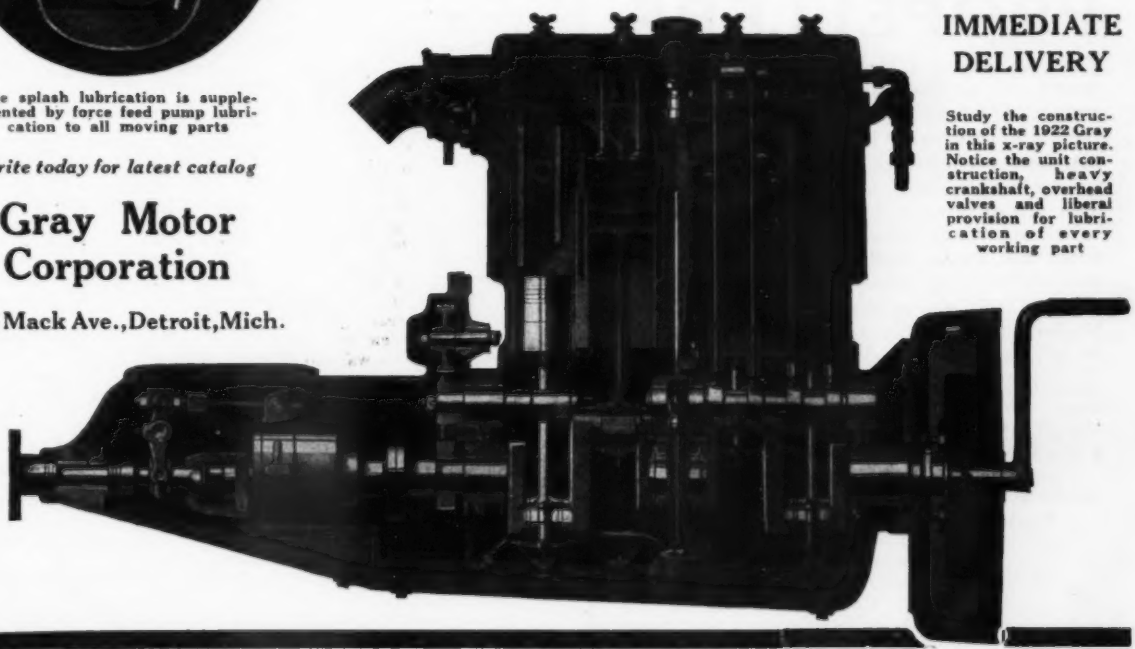
Gray Two-Cycle Motors are built in models from 3 to 8 h.p.

Write today for latest catalog

Gray Motor Corporation

2106 Mack Ave., Detroit, Mich.

IMMEDIATE DELIVERY



Study the construction of the 1922 Gray in this x-ray picture. Notice the unit construction, heavy crankshaft, overhead valves and liberal provision for lubrication of every working part

STEARNS-McKAY
MARBLEHEAD
ANTI-FOULING GREEN BOTTOM PAINT

For Racing and Cruising Yachts and Vessels

Increases speed, saves fuel and large expense bills. A hard and peculiar slippery finish which lasts a long time. It pays for itself many times over by eliminating costly repairs, scraping and repainting work. It is a powerful wood preservative and anti-fouler, and is equalled only by Copper Sheathing as a protection against Teredos.

MARBLEHEAD FULL AND SEMI-ENAMEL YACHT WHITE FOR TOPSIDES

Advice and consultation free on all painting and repair work.

STEARNS-McKAY MFG. CO
MARBLEHEAD MASS. U.S.A.

GENUINE
HARTHAN
TRUE SCREW
PROPELLERS

The principle of a True Screw is strictly followed out in the patterns from which all genuine Harthan Propellers are made. This type is known to be the most efficient.

Harthan wheels are made of a special bronze composition, very tough and strong. This allows a very thin blade, the edges of which are brought down very sharp, which, with the extra high polish, reduces the power-absorbing element to a minimum.

We can supply propellers with two or three blades, in practically any pitch, either right or left hand.

Look for the Trade-Mark on Each Blade
McFARLAND FOUNDRY & MACHINE COMPANY
1100 Willow St.,
TRENTON NEW JERSEY
Representatives
NEW YORK: Topping Bros., 122 Chambers Street
PHILADELPHIA: F. Vandercherchen's Sons, 7 N. Water Street.

When A Wreck Is Not A Wreck

(Continued from Page 22)

generate electricity not only for its own propulsion, but for propulsion of her consort New Era, electricity being delivered to New Era over an electric cable extending from Dawn. Another unusual feature is the fact that Dawn, the power boat follows after New Era. These boats have been repeatedly illustrated and described in Marine and Engineering Papers.

Accompanying Dawn and New Era was Ambra V. under the command of her owner Parker H. Kemble. The yachts left their anchorage at 3 A. M. April 26, a moderate south west wind blowing, and a considerable sea running from previous heavy weather. Very satisfactory progress was made and by eleven o'clock the yachts were off Little River Inlet, located almost on the boundary between North Carolina and South Carolina. During the morning the south west wind freshened and the sea increased, and while it would not be considered stormy weather, it was the judgment of all parties that it would be desirable to make the harbor at Little River, particularly as Ambra V. had made this harbor coming down the coast the previous fall, and would like to make a return visit on the way north. It was further understood, that the entrance was well marked by buoys and of sufficient depth for the boats to go in.

This Inlet is one of the many small harbors on the coast with shifting bars and is not generally used on that account.

We had moreover, a local Pilot entirely familiar with the conditions and headed in without hesitancy towards a long line of breaking surf which as we neared it gave anything but an encouraging sensation. The channel buoys were in plain sight, but the bottom was not. The writer however, can assure you, that we soon knew it was there, and altogether too near the top, within a comparatively short distance of a buoy marking the harbor entrance where we had every reason to anticipate that at the stage of the tide, we would find water six or seven feet deep. New Era struck bottom and then struck again, and Dawn coming on about 75 ft. behind us also struck.

What had been running practically dead before the sea. In a case like this, there is nothing to do but to hang on and hope that you will pound across. It took but a few minutes for us to realize that this would not happen. Sea after sea broke over Dawn, and water coming in through the cabin windows shut down the power plant. Not the least important element in this case, was the fact that the tide was going out against the wind, and anyone who has seen a sea under similar conditions will understand that there was some sea running. The tide carried New Era back towards Dawn and in spite of all we could do, these two boats got together and as though each one was blaming the other for the difficulty that they were in, commenced to pound each other furiously and fast, fenders and cushions and everything else that was loose were in demand to keep between them, and we finally managed to force them apart, so that each one might take its pounding alone. They certainly were getting some pounding. Every sea that came in would lift the boat from the bottom and as it went down, drop it with a thud that would shake everything and make you believe that nothing put together with the hands of man would remain together long.

Dawn was aground on the crown of the bar. New Era drawing 6 inches less had gotten over the worst of the bar and by that was more protected from the heavy sea. The first thing to do, was to separate the cable connection and also the manilla line connecting the two boats. It was then found that New Era could be moved by her battery and could be gotten off, if we could head her around before the wind. This we accomplished by setting a canvas awning alongside the forward stanchions of the awning frames. By this means New Era was headed around against the tide before the sea and then by operating the battery and using the canvas as a head sail she was worked into deep water behind the bar. In the meantime Dawn continued to pound and the seas to break upon her. By reference to the photographs taken from New Era the situation will be quite plain and a close examination will show that there was a heavy sea and half a gale blowing approximately thirty miles an hour. Alongside Dawn in the picture under the lee of her bow will be seen her small boat and a careful examination will show the crew unloading their luggage, and an examination of the flag will show that it is inverted, in other words, the crew of Dawn had come to the conclusion that it was all over with their ship and they actually removed all their belongings to the small boat and brought them over to New Era. They were however, persuaded to take the owner back with them and an investigation of the situation convinced him that the boat would come off, as soon as the tide came in and float, and he insisted upon staying there and seeing just what would happen.

An examination showed that the level of the water inside and out was the same, that the water had not come over the

(Continued on Page 97)

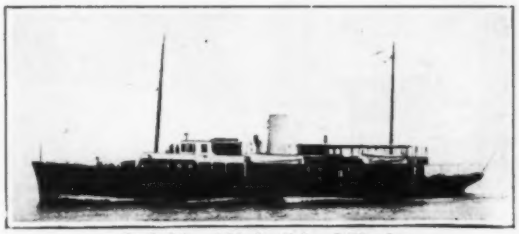
Advertising Index will be found on page 110

YACHT BUILDERS

THE facilities for yacht building afforded by the great plant of the Newport News Shipbuilding & Dry Dock Company are without equal.

We specialize in furniture, wood carving and decorating for yachts. We also have special facilities and skilled workmen for reconditioning and repairing yachts as well as larger vessels such as the S. S. Leviathan which is now undergoing reconditioning at our plant.

The location of our plant at Newport News on Hampton Roads gives us a harbor free of ice at all seasons and next door to America's favorite cruising grounds.



Dolphin-180 ft. Diesel Yacht

The furniture of Dolphin was built in our own shops.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

YACHT BUILDERS AND SHIPBUILDERS

Plant Located at Newport News, Va. on Hampton Roads

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Beebee Boats.

EEBEE Boats Comprise A Line Of Racing Hydroplanes, Special Runabouts And Stock Boats Whose Workmanship-Speed And Performance Is Guaranteed.

RACING HYDROPLANES
GENTLEMENS' RUNABOUTS
GOLD CUP RUNABOUTS

26Ft-0" V BOTTOM RUNABOUT —40 H. P. Kermath.

20Ft-0" FAMILY LAUNCH — 5 H. P. Kermath.....$750.00

18Ft-0" "PLAYBOY" LAUNCH— 3 H. P. Kermath.....$450.00

16Ft-0" "MOTO-ROW" — 2 H. P. Caille $250.00

16Ft-0" "BB" OUTBOARD BOAT $95.00

15Ft-0" DOUBLE ENDED ROW BOAT $75.00

Write for Complete Details

Sydney C. McLouth
Marine City, Mich.

"The Capitol"

MARINE UNIT POWER PLANT

COMPLETELY ENCLOSED — COMPLETELY EQUIPPED

If you own or are planning the kind of a runabout or cruiser that deserves a really excellent power plant, you should know more about the Capitol.

There isn't a smoother, quieter running marine engine. Vibration and noise are eliminated by perfect balance, wide-faced helical-cut timing gears, force feed lubrication, ball bearing universal joint, three point suspension, and many other improvements.

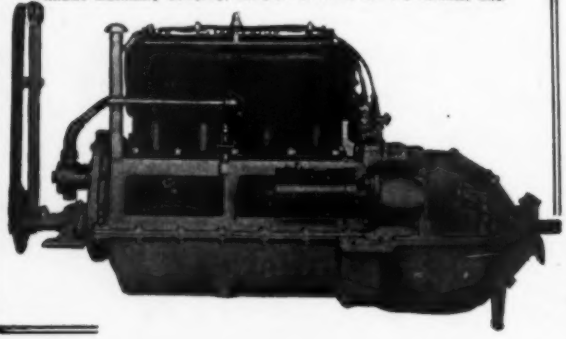
Delco ignition, Atwater-Kent two-unit starting, lighting and generating system, Willard storage battery, Stromberg or Schebler carburetor instrument plate and all other necessary equipments of highest grade.

Bore 4¼"
Stroke 5½"
High Speed Model 60-65 H. P. at 2000 R. P. M.
Medium Speed Model 30-34 H. P. at 1000 R. P. M.

Write today for complete description and prices

AUTO ENGINE WORKS, St. Paul, Minn., U. S. A.

Eastern Representatives: Ventnor Boat Works, Atlantic City, N. J.; Fred C. Duclon, Alexandria Bay, Jefferson Co., N. Y.; Gray-Aldrich Company, Inc., 84 Atlantic Ave., Boston, Mass. Canada: The A. R. Williams Machinery Company, Ltd., 64-66 Front St. W., Toronto, Ont.



When A Wreck Is Not A Wreck

(*Continued from page 92*)

cabin floor and had not wet or damaged any of the interior. The tide turned about 1.30. Meantime, the anchor had been gotten out and preparation made to kedge off, it being understood that as the tide rose, Dawn began to lift and pound again, but as it will be readily understood at every lift it was possible to take in slack on the kedge line and move the boat Dawn a short distance across the bar, with the result that by 2.30 she was afloat. In the meantime, Ambra V. had entered the harbor by another channel and had come up around and had taken New Era in tow up Little River, leaving her at a safe anchorage something over a mile up the River, and had come back to lend every assistance possible to Dawn.

New Era had pounded across the bar without springing a leak, but Dawn had been driven across and over a channel buoy cutting a long ragged hole in her bottom, and as previously stated, the water level inside and out was the same.

Then why did she remain afloat, with no water over the floor and no damage by water to her machinery? Thereby hangs the tale and the reason for this narrative.

In constructing Dawn and New Era, the floor of the cabin was placed six to eight inches above the load water line, and all the space below this floor not occupied by fuel or other tanks was filled in, the irregular and wedge shaped spaces with balsa wood, and the larger spaces with copper-tanks, therefore, when the hole was pounded in the bottom of the boat and water entered through it, it found not the usual large vacant space, but only the small spaces between the buoyancy boxes, with the result, that only a small amount of water could enter, and with a further result, the boat floated, similar to a raft with the water level inside and out the same.

Dawn was taken in tow by Ambra V. and anchored in a narrow part of the creek near New Era. At the evening high tide, Dawn was put on the beach and the next morning we had the satisfaction of looking over her underbody and seeing the result of her struggle on the bar. Her shoe and rudder were entirely gone, and the heel of the dead wood badly pounded. On one side was a long cut something over 20 ft. in length. As this happened to be on the shore side as she was first put on the beach, she was turned around at next tide to make the opening accessible. Exploration was then conducted into the surrounding country and a saw mill discovered from which suitable material was obtained to use in securing a canvas patch over the hole. At the next tide New Era was put on the beach and it was found that her shoe had been carried away and the rudder stem badly bent. The rudder was straightened and the shoe removed, a temporary rudder was built for Dawn, both boats floated and made ready for continuing their cruise.

The power generating plant in Dawn was found to be uninjured and both motors were in perfect working order. The nearest point where permanent repairs could be made was Wilmington, North Carolina, some fifty miles up the Cape Fear River. While it would have been entirely possible for the boats to have made this trip under their own power with temporary rudder as rigged on Dawn, it was decided that discretion was the better part of valor, and it would be safer to have them towed, and arrangement was made with the tug Atlantic which was due to take a barge of lumber from Little River to Wilmington, so the start was made on Monday, May 1, and Wilmington reached at 10.30 P. M.

Both boats were put upon a marine railway at Wilmington, and a continuation of our cruise North commenced again Thursday May 11, when we dropped down to Southport at the mouth of the Cape Fear River, and the next morning made the continuation of our outside run 125 miles to Beaufort, North Carolina.

Upon passing Wrightsville Inlet, we saw what we identified as the 85 ft. house boat Nahmeoka, which appeared to be just inside the bar. We learned however, upon arriving at Beaufort, that Nahmeoka had attempted to make the Inlet, pounded across the bar and sunk in deep water on the inside. Every effort was made to save this boat, but she was finally given up as a total loss valued at $100,000.00.

As a final word, I would state that Dawn and New Era protected by non-sinkable construction, have made two trips to Florida and return, covering in two years summer and winter cruising, more than 8,000 miles, and the total damage due to our experience upon the bar at Little River Inlet including the towing charge to Wilmington, was slightly under $500.00. During that time the owner has carried only fire insurance on these boats, and the difference in cost or saving between this fire insurance and full marine underwriting, would pay for the entire damages several times over.

A further statement should be made that the cost of rendering yachts safe against sinking by the method of internal buoyancy is such, that the saving in insurance would more than pay for the same in two years.

Advertising Index will be found on page 110

KERMATH

A Kermath Always Runs

From Every Point Of View Undoubtedly America's Leading Marine Motor

THE many great records that Kermath is establishing in all parts of the world stamp it, from every angle, as a dependable marine motor.

Go into any of the well known watering places, whether on the Atlantic or Pacific Coast, whether up rivers or on any of the well known lakes, and wherever you find motor boats of all sizes and types, you will find the Kermath doing an efficient, economical, dependable job at all times.

We would like you to get this information direct from the owners—not from us. So, if you will write us, we will send you as many names as you wish.

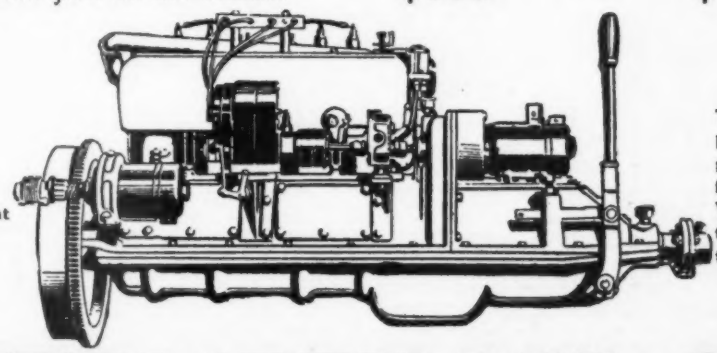
Remember, no Kermath has ever worn out. The first Kermaths built are still running.

Write Dept. D for interesting and instructive literature.

3 H.P. to 40 H.P. Marine Motors.

$135 — $1550

Quality Right
Design Right
Materials Right
Workmanship Right
Prices Right



This most complete line of marine engines is an ideal line for a dealer to sell. Write us for our detailed catalogue and territory.

KERMATH M'f'g Co.

DETROIT 5850 Commonwealth Avenue **MICHIGAN.**

"A Kermath Always Runs"

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantage of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propellor-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it: Advice for the Beginner, Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsucessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed *vs.* Heavy Duty; Long Stroke *vs.* Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers *vs.* Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbitting a Worn Bearing; Should Fuel Line be Inside or Outside?

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

Practical Suggestions for Handling, Fitting Out and Caring for the Boat

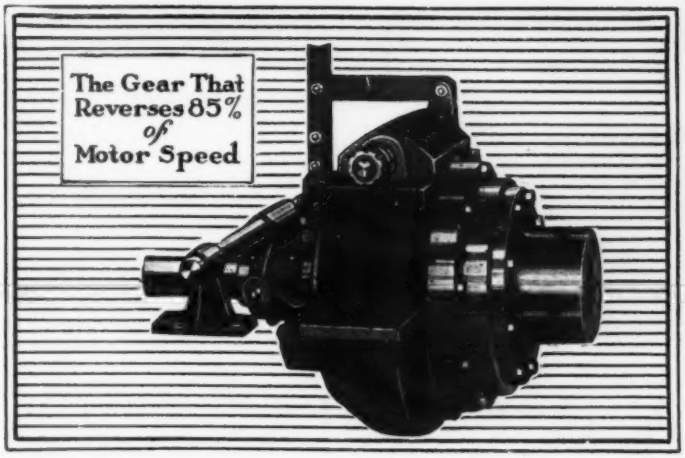
Volume 6.—This volume is an especially valuable one. You will find in it points covering the care of your boat that you never dreamed of before. Whether you are a beginner or a finished expert this book will give you a better knowledge of the handling of your craft than you can imagine. List of contents: Putting the Boat into Commission; Fitting Out a Thirty-Footer; Suggestions for the Beginner; Refinishing Bright Work; Keeping the Wood Surface Bright; Putting the Boat Out of Commission; Laying Up an Unsheltered Boat; Hauling Out for the Winter; Covering the Boat for the Winter; Launching from a Wharf; Correcting Faults; Lengthening Out the Boat; Moorings and Buoys; Taking Steps to Safeguard the Anchor; What to Use in the Bilge; Preserving the Wood in Boats; Emergency Rigs for the Cruiser; Auxiliary Sails for the Cruiser; Providing an Emergency Rudder; Preparing for Southern Waters; Stopping the Troublesome Leak; Replacing a Broken Plank; Removing Broken Lag Screws; Raising the Boat's Stern; Clearing the Propeller; Protecting the Bow and Stern; Open Boat Sleeping Quarters; Ventilating the Cabin of Small Cruisers; Converting the Open Boat to a Cruiser; Making a Cover for the Open Boat; Preventing Electrolysis; Building a Club Float; A Floating Boathouse; Constructing a Landing Stage; Building the Marine; Keeping the Thief Out; A Place for Your Shore Clothes; Stowing for Life Preservers; The Winter's Alterations; What Changes Shall I Make; The Satisfactory Bilge Pump; The Pressure Water System; Making a Pelorus; Your Storm Curtains; Life-Saving Equipment; The Absent Owner's Anchor Light; Mounting the Reverse Gear.

Price $1.50 Per Volume, or $7.50 Per Set of Six Volumes of Over 1,000 Pages

The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR BoatinG **119 West 40th Street, New York**

Advertising Index will be found on page 110



Why Mianus Motor Works Puts It Up to Old Man Joe

Paragraphs from a recent letter

"After using your Husky Gears for about three years in connection with the 2-cylinder, 3-cylinder, 4-cylinder and 6-cylinder (of 20 HP per cylinder) MIANUS IMPROVED DIESEL OIL ENGINE, we think it entirely appropriate to tell you that your Gears have operated with complete satisfaction.

"Their high ratio of reverse gives the quick backup at the full power of the engine, so highly essential for the satisfactory operation of all heavy duty engines, and their rugged, well designed construction, has made them dependable and well adapted to our engine in the many installations we have used them on.

We are particularly careful that nothing but the very best material shall enter into the construction of our engines and, naturally, we are pleased with a gear that can be depended upon in making up our complete unit."

Yours truly,
MIANUS MOTOR WORKS INC.
(Signed) Geo. S. Watts
President

put it up to old man Joe

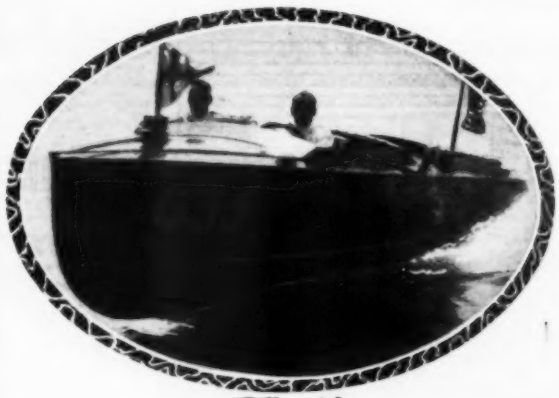
The Snow & Petrelli Mfg. Co., 156-B, Brewery St., New Haven, Conn.

JOES DISTRIBUTORS AND SERVICE STATIONS

New York—Sutter Bros., 44 Third Ave. Service Station foot of E. 92nd St., Brooklyn.
Philadelphia, Pa.—W. E. Gochenaur Mfg. Co., 631 Arch St.
Baltimore, Md.—Unger & Mahon, Inc., Pratt & Gay Sts.
Detroit, Mich.—Henry H. Smith & Co., 252 Jefferson Ave., East.
Cleveland, Ohio—Wm. F. Meier, 1433 W. 77th St.
Chicago, Ill.—W. L. Masters & Co., 229 North State St.
New Orleans, La.—Arthur Duvic's Sons, 130 Chartres St.
Southern California—Fellows & Stewart, Inc. Wilmington.
Seattle, Wash.—Pacific Marine Engine Co.
Toronto, Canada—A. R. Williams Machinery Co.
Montreal, Canada—E. Drolet, 137 McGill St.
Newfoundland—John Baron & Co., 241 Water St., St. John.
New Brunswick, P. E. I.—T. McAvity & Son, St. John, N. B.
England—J. King & Co., 10 Church Row, Limehouse, E., London.
Turkey—Societe Generale d'Automobiles, Constantinople.
Argentine, S. A.—J. Banham & Sons, Buenos Ayres.

JOES FAMOUS REVERSE GEARS

REVERSE 80%-88% of MOTOR SPEED



Belle Isle

BEARCAT

ITS unapproached mechanical excellence has given the Belle Isle Bearcat an international reputation for unfailing dependability. This same sterling quality is responsible for the Bearcat's freedom from the need of the continual adjusting and repairing that ruins the sport of powerboating for many devotees.

Authoritative recognition of the Bearcat's superior construction is to be found in the fact that it enjoys the lowest marine insurance rate allowed any runabout.

For delivery in Florida in time for the winter season, you should place your order now.

Hall-Scott Marine Motors standard power equipment in all stock Bearcat, Bearcat 4 cylinder, $6.500; Bearcat, 6 cylinder, $7,500. Other Belle Isle runabouts from $1150 up.

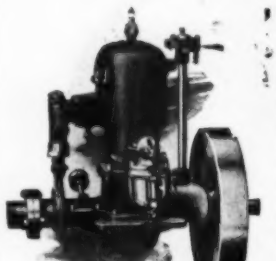
BELLE ISLE BOAT & ENGINE COMPANY

9662 E. Jefferson Ave., Detroit, U. S. A.

Dept. B

LOCKWOOD-ASH

MARINE IM ENGINES



Model 24, 1-cylinder, 2-cycle. Two sizes—2½ H.P. and 4 H.P.

For small power boats

Simplicity, light weight, easy starting, absolute reliability—for eighteen years these qualities have commended L-A two-cycle engines to the expert engine man and to the amateur alike.

Prices range from $77.50 to $144.00. Write for complete description and specifications. Convince yourself that L-A two-cycle engines are suited to every need for ideal small boat power.

Lockwood-Ash Motor Co.

2207 Jackson St.
Jackson, Mich.

DISTRIBUTORS

Hyde Boat & Engine Co., 358 Bergen St., Brooklyn, N. Y.

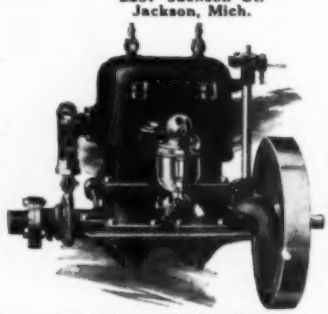
F. I. Mitchell 663 Notre Dame St. E., Montreal, Que., Canada

Arthur Duvic's Sons, 130 Chartres St., New Orleans, La.

William Grossman, 1630 Pine St., St. Louis, Mo.

Henry M. Owen, Newport, Ark.

Veihl Crawford Hdw. Co., Fort Worth, Texas



Model 48, 2-cylinder, 2-cycle. Two sizes—6 H.P. and 8 H.P.

96

Yard and Shop

(*Continued from page* 52)

she went over the line with a flying start exactly with the starting gun.

Nick Nack, a 32-foot runabout belonging to Commodore Humphrey Birge, won the third place in the Fisher-Allison race at Hamilton. She was defeated only by boats equipped with the twelve-cylinder 400 horsepower engines in one case and in the other with two six-cylinder, 300 horsepower motors. This boat, the winner, had 2700 cubic inches piston displacement as compared to only 824 cubic inches in Nick Nack's Hall-Scott engine. Leaving Hamilton, Nick Nack competed in races at Toronto and Buffalo and was successful in winning additional trophies.

In cruising boats of larger size, Hall-Scott motors have performed equally well. A pair of six-cylinder 200 horsepower engines have proven very satisfactory in the 60-foot cruiser owned W. E. Bond, of Biloxi, Miss. Another pair in Albert H. Hayes' express cruiser, King Fisher, have also been operating successfully up and down the California coast.

Racing Model Reverse Gears Receive Universal Praise

The Racing Season of 1922 is unquestionably the greatest in the history of Motor Boating, and the Snow & Petrelli Mfg. Co., of New Haven, Conn., manufacturers of Joe's Famous Gears, take great satisfaction from the fact that while nearly all the winners of the big events were equipped with Joes Duplex Drive Gears, not a single failure has been reported because of gear trouble. Racing equipment of all sorts is driven to its limit, and weakness at any point at a crucial moment is fatal. Therefore, the materials must be of very high quality, workmanship faultless, and the design one that will give the necessary strength, lightness and balance in small compass to stand the terrific speed and strain.

That so large a majority of big racers successfully "Put it up to Old Man Joe" with such gratifying results, is proof that their judgment was sound, and that he has the goods. It will be of general interest to enumerate some of the famous boats that are equipped with Joes Gears, but the following is by no means the complete list:

Miss America I, II; Misses Detroit I, II, III, IV, V, VI; Packard Chriscraft; Packard Baby Gar; Gar Jr.; Gar Jr., II; Baby Gar I, II, III; Miss Toronto; Miss Chicago; Miss Minneapolis; Hurricane II; Margaret III; Meteor III; Miss Liberty; Ramalda; Viroling; Great Lakes Runabout; Jersey Flier; See-Gar, and many others.

The Joes special racing model, for instance, transmits the power of the 12 cylinder Liberty and other high power motors, and is only 10 inches in diameter, and weighs about 170 lbs. This figures only about two-fifths of a pound weight per horsepower transmitted.

Gar Wood says, regarding these gears:

"I can only say that these winnings are partially made possible because of the reliable and efficient equipment used in my boats, a part of which equipment is furnished by yourself in the form of clutches and reverse gears. Needless to say, this equipment is the best possible obtainable according to our belief, and I want to congratulate you on your successful design and also wish to say that I appreciate your efforts in bringing your product up to the standard it now is, keeping in mind, as I believe you have done, that the price must necessarily be reasonable, in order that motor boat builders and owners can take advantage of same. I have always been a booster for your gear because I believe in the principle of transmitting the power through the multiple discs and not thru the gears, except when in reverse motion. More success to you!"

J. G. Vincent, of the Packard Motor Car Company, writes: "I am glad to be able to advise you that my Packard Chriscraft boat, with which I won the Gold Cup Race, is equipped with one of your Joe's reverse gears, and that it rendered completely satisfactory service. I have been somewhat undecided about reverse gear equipment, but after my experience with your gear, I feel inclined to adopt it. After giving the matter careful consideration, I feel that we should plan on standardizing your 143 special racing model, for use in both our 1M-618 and 1M-1237 engines. I am led to make this decision on several counts. Reliability and smooth action at high speed are of more importance than cost."

These striking opinions from such high authority refer only to racing gears. However, Joes gears made for heavy and medium duty are equally well endorsed in their field. Full information of the complete line or for any particular installation will receive prompt attention and hearty co-operation.

(*Continued on page* 102)

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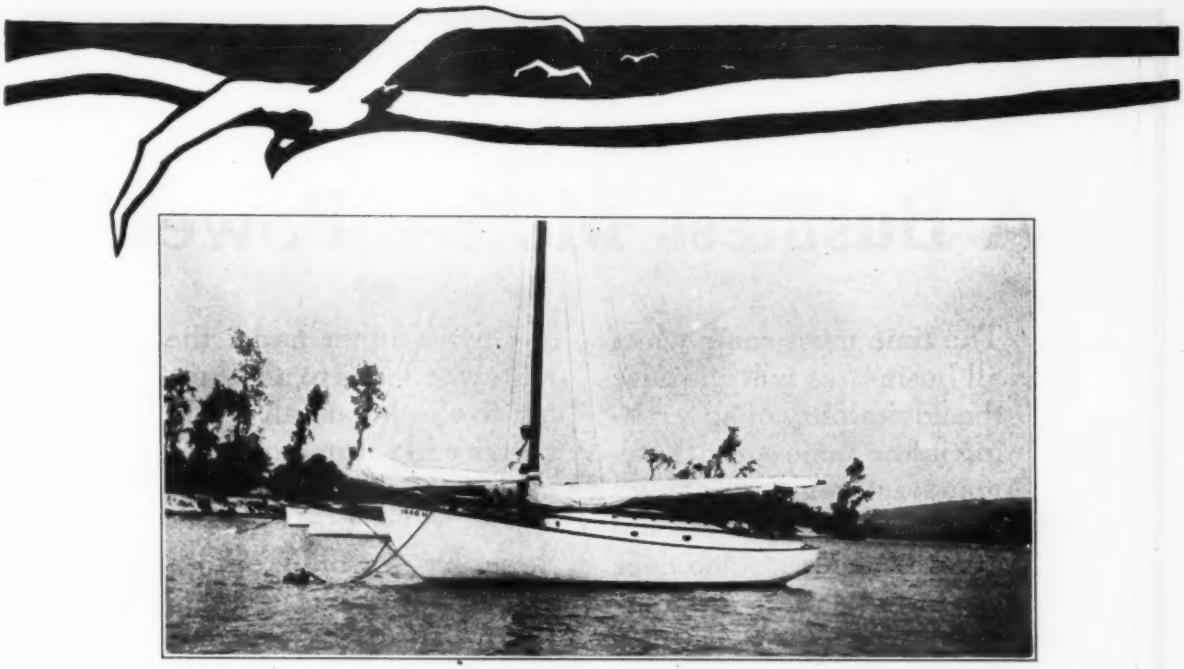


The "Welwyn"
Dr. Frank K. Hallock, joyful owner

Some Combination!

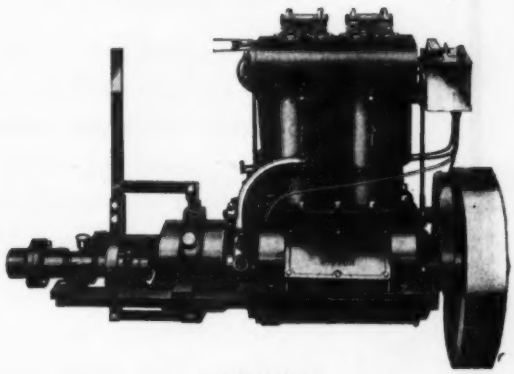
Designed by Alden
Built by Lawley
and
POWERED by FRISBIE

THIS 30 ft. x 9 ft. 9 in. x 3 ft. auxiliary sailed from Boston, Mass. to Middletown, Conn. on her maiden trip. On the final stretch her 10 H.P. Frisbie Motor was started at daylight in Newport and shut off in Middletown after dark. Any Frisbie Motor will give the same kind of all day service.

Catalog and particulars for the asking

THE FRISBIE MOTOR COMPANY

7 College St.,
MIDDLETOWN, CONN.



13 Models
1, 2, 3, 4, 5 & 6 cylinders
5 to 100 H. P.

Frisbie
VALVE-IN-HEAD
MOTOR

A Business Motive Power

The time must come when all businesses will consider the advisability of advertising in the same spirit that a manufacturer ponders over the advisability of adopting a new machine. One does not install a piece of labor-saving mechanism because it suits his fancy; but because the efficiency of the business requires it.

He expects the new machine to reduce his cost to operate—perhaps to make a better product—and thus aid him in meeting competition and making larger profits.

Advertising is exactly similar. The man who refuses to consider it as a possible expedient, simply shuts his eyes on one of the problems of his business. He might as well ignore the banks as sources of credit when he has need to borrow capital.

On the other hand, the man who looks to advertising to checkmate all weaknesses and shortcomings of his business and to carry it along to victory despite these, has a childlike faith in the miraculous.

Advertising will not make his product or his service any better than they are; but it will bring him the full benefits of their merits. It will not eliminate wastefulness in his factory or his store; but it will reduce his cost to operate. It will not make illogical selling methods successful; but it will assist good selling methods, and often point the way for improving them.

Advertising is the most inexpensive motive power that the manufacturer or merchant can buy today. It is a form of stimulus that brings excellent returns on the investment.

[Published by MoToR BoatinG in co-operation with The American Association of Advertising Agencies]

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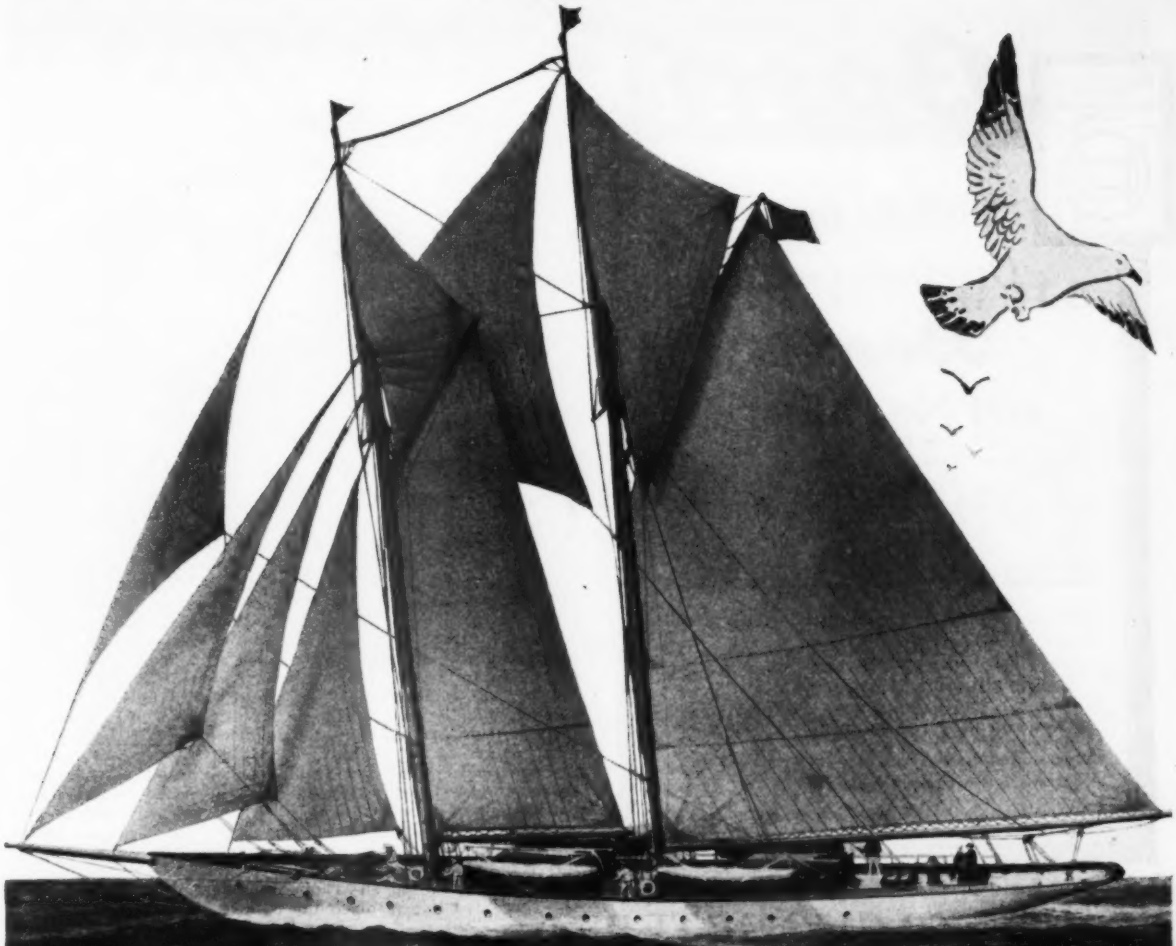


Schooner Yacht "*Goodwill*"

KEITH SPALDING, Owner

Designed by

HENRY J. GIELOW, Inc.

25 West 43rd Street, New York City

POWERED BY A 180 B. H. P.

NELSECO MARINE DIESEL ENGINE

THE NEW LONDON SHIP & ENGINE CO., GROTON, CONN.
U. S. A.

Always Look For "The Name ROBERT BOSCH and this TRADE MARK

Bosch

"I Want the *Original*, Genuine Bosch and No Other!"

Motor Boat Owners who know, insist on the world famous Ignition System which has delivered the premier automotive electrical service since the dawn of the industry.

Be Sure **Specify Robert Bosch**

New edition "Bosch Facts" and latest literature mailed on request.

Robert Bosch Magneto Co., Inc.
OTTO HEINS, President
123 West 64th Street, New York

Several hundred U. S. Service Stations and Representatives the world over.

COMET TACHOMETER

Price $27.00

Specialists in electrical equipment for motor boats and yachts. Comet Boat Lighting Plants, Generators 6-8 volt to 110 volt, Switchboards, D. C. Magnetos for make and break or jump spark. Tachometers, etc.

Write today for Bulletins and prices.

COMET ELECTRIC CO. 1241 St. Paul St. Indianapolis, Ind.

Strong and Substantial Rudder Construction

(Continued from page 88)

objections are a weakened shoe to stand the hard usage and vibration of rudder, as well as additional bolt heads to collect weeds and cause friction. A better plan is the one shown where the rudder pipe is made about ¼-inch oversize and a loose bronze bushing or sleeve provided to bring the rudder post up to size of pipe and stuffing box. By removing the stuffing box and packing, also quadrant, this loose sleeve may be pushed up the rudder post and out of the pipe, thus providing sufficient clearance so that the rudder will pass along side the shoe when unshipped at lower end.

An ordinary stock stuffing box of the style threaded for a pipe may be used, provided a wood filling piece is used as shown to fill in the angle with horn timber. Use paint soaked cotton flannel to make tight joint between. Sketch shows bolts through horn timber to hold stuffing box and pipe bearing securely.

C. H. C., Saginaw, Mich.

Coupled Rudder Stock Is Desirable

GALVANIZED iron or steel is the cheapest and at the same time the strongest material to use for the rudder blade and stock for a cruiser. Bronze of certain compositions may be practically as strong and is supposed to be non-corrosive but the cost is high and it will give little more satisfaction than galvanized iron. As to brass, one experience in having rudder shaft and skeg turn to soft spongy copper, halfway through and then break off, was enough. The usual method in making a rudder is to use a straight shaft slit for the blade and necked down where it goes through the skeg bearing, but a much better way is to swell out the shaft, by forging, slightly beyond the slit, to strengthen this part, and to leave the lower end the same diameter as the upper part and long enough to allow plenty of play in the skeg bearing, so that the rudder would not unship should the pin corrode away or come out. The blade should be well riveted to the swelled out portion of the shaft and the whole assembly should then be galvanized as one piece. Sometimes the shaft is sawed through from the lower end to form the slit for blade, but this is very poor construction

If the rudder and shaft can be removed without loosening the skeg, and this is often the case for a small cruiser, well and good; but if not the shaft should be in two parts, the joint coming between top of blade and stern timber. Two flanges, preferably forgings, should be driven into the shaft ends and keyed, then the whole galvanized. Four bolts will hold the shafts together and by removing them the blade can be easily removed at any time for repairs or for removing the propeller shaft. Care must be taken that there is enough up and down play to permit the two flanges to clear, otherwise the blade could not be removed.

Regarding the rudder port, the best way is to use a length of galvanized pipe threaded the whole length through the stern timbers, if a plumber can be found who is willing to tackle the work. A pipe could of course be threaded in the lathe as well. Leave the upper end long enough to get a hold with the stillson while screwing in and use plenty of red lead. The hole might have to be bored with an expansion bit if no auger could be found the correct diameter. This means considerable work but is well worth it.

H. H. P. Oakland, Calif.

Yard and Shop

(Continued from page 98)

What Is A Rebuilt Engine?

An attractive novelty in the way of a listing of rebuilt motors has just been issued by the Marine Engine Company of Philadelphia. This little booklet is unusual in that it describes in complete detail, a large number of the engines which have been completely rebuilt by this company. A seeker for an engine of any particular specifications may readily find what he is after in this list. Not only is the make, model, and power indicated but all other particulars are given so that the prospective purchaser may know before he starts just what the machine is like. The engines when rebuilt by this company are backed completely by a bond which insures that they are in first class running order. All work on them has been done by skilled marine engine mechanics and new parts used wherever required. No engines which come into their hands are sold under the excuse "As is." Any engine which is not worth the effort of rebuilding is junked without hesitation.

(Continued on Page 108)

Advertising Index will be found on page 110

MATHIS YACHT BUILDING CO.

Another Constant Keynote

OF
MATHIS-BUILT
BOATS OF ALL TYPES

SKILFUL CONSTRUCTION

ONLY the craftsmanship of the master artisan can make the designer's vision become a perfected reality. Materials and parts may be as perfect as the design, yet without constructional skill of the highest order, the early promise of the plans is lost.

That Mathis-built has come to mean what it does today is due solely to the fact that in the Mathis yard joinery has never been a secondary consideration—generations of skill stand back of every boat we build.

Finish, joinery, carpentry, in every branch that enters, we must never deviate from our old-established standard—the best. Specific instances that we maintain constantly are offered in the perfection attained in the mahogany planking on the "Lazy Lady" (below), as well as the beautiful effect of the mahogany deck-house on this same boat. The exquisite mahogany paneling on interior of the 75-ft. "Amitie" of Charles B. Prettyman (above) is another fine illustration that simply echoes the grade of workmanship in evidence on all

MATHIS-BUILT HOUSEBOATS
Cruisers and Auxiliaries

Right planning, right execution of the plans and economy in production and operation have made Mathis-built boats the choice of men who know.

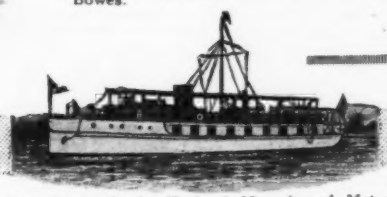
LAZY LADY

The most modern type of express cruiser. Speedy—yet at the same time a real cruising vessel. Her dimensions are 67 ft. length, 13 ft., 6 inch beam and draws 3 ft., 8 inches. Built in the Mathis yards for Mr. Robert Wolstenholme. Designed by Thomas Bowes.

MATHIS YACHT BUILDING COMPANY

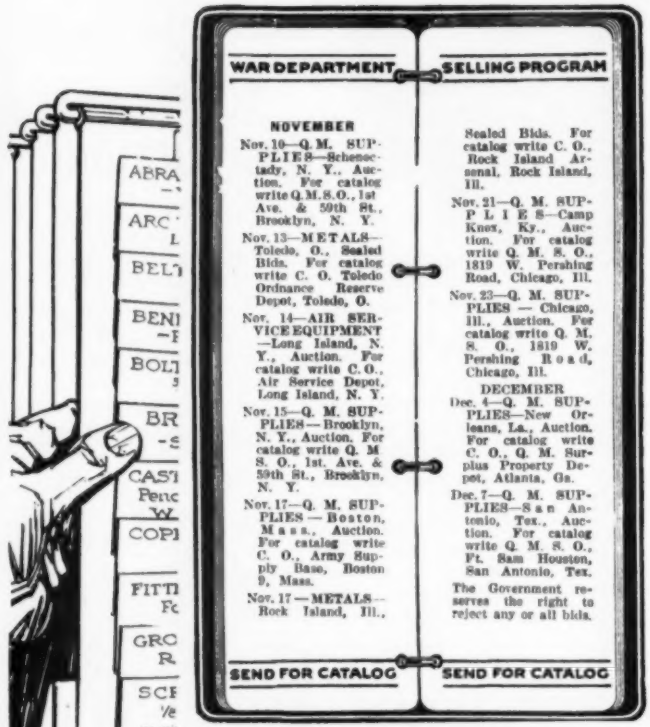
Specialists in Houseboats and Cruisers from 40 to 120 feet

Cooper's Point Camden, N. J.



HOUSE BOATS AND YACHTS

Have You a Ten Minute Man ?


WAR DEPARTMENT
SELLING PROGRAM
NOVEMBER
Nov. 10—Q. M. SUPPLIES—Schenectady, N. Y., Auction. For catalog write Q.M.S.O., 1st Ave. & 59th St., Brooklyn, N. Y.
Nov. 13—METALS—Toledo, O., Sealed Bids. For catalog write C. O. Toledo Ordnance Reserve Depot, Toledo, O.
Nov. 14—AIR SERVICE EQUIPMENT—Long Island, N. Y., Auction. For catalog write C. O., Air Service Depot, Long Island, N. Y.
Nov. 15—Q. M. SUPPLIES—Brooklyn, N. Y., Auction. For catalog write Q. M. S. O., 1st. Ave. & 59th St., Brooklyn, N. Y.
Nov. 17—Q. M. SUPPLIES—Boston, Mass., Auction. For catalog write C. O., Army Supply Base, Boston 9, Mass.
Nov. 17—METALS—Rock Island, Ill., Sealed Bids. For catalog write C. O., Rock Island Arsenal, Rock Island, Ill.
Nov. 21—Q. M. SUPPLIES—Camp Knox, Ky., Auction. For catalog write Q. M. S. O., 1819 W. Pershing Road, Chicago, Ill.
Nov. 23—Q. M. SUPPLIES — Chicago, Ill., Auction. For catalog write Q. M. S. O., 1819 W. Pershing Road, Chicago, Ill.
DECEMBER
Dec. 4—Q. M. SUPPLIES—New Orleans, La., Auction. For catalog write C. O., Q. M. Surplus Property Depot, Atlanta, Ga.
Dec. 7—Q. M. SUPPLIES—San Antonio, Tex., Auction. For catalog write Q. M. S. O., Ft. Sam Houston, San Antonio, Tex.
The Government reserves the right to reject any or all bids.
SEND FOR CATALOG
SEND FOR CATALOG

NO successful treasure hunter is worth more to you than the clerk who spends ten minutes a day looking up War Department ads.

For there is treasure a-plenty in these. They announce Surplus Property sales that spell tremendous savings and quick deliveries.

The things you need are among them. All you have to do is LOOK. Then write for catalog. Then attend the sale.

Don't overlook a single ad. If you do, you may overlook a saving of great proportions. Your clerk can look them up and then route the publication through the various departments.

It's only a ten minute job—or less. And big dividends await your taking. If you want to know more about the sales, ask Major J. L. Frink, Chief, Sales Promotion Section, Office, Director of Sales, Room 2515 Munitions Bldg., Washington, D. C.

Send for this booklet—"The story of War Department Sales."

WAR DEPARTMENT

"That's some engine for trolling"

Any time you want to get a line on the Universal engine for dependability, just ask the fellow who uses it for trolling.

He will tell you that she pushes a boat through the water, so quiet and steady and sure, at two miles an hour, that you never have to think about it when you are fishing.

He will also tell you that you can step on the gas and get to and from your fishing grounds in mighty fast time, if you want to.

Remember, there is just one quality and one size of Universal engine, and it is a darn good one. 22 years of engine building experience has gone into it. A world wide reputation is back of it. The Universal name is on it.

It doesn't matter what kind of a boat you want to use a universal engine for, she will do the work—for auto boats, launches, fishing boats and work boats anywhere from 14 to 30 feet in length. You can get the Universal with electric self-starter and reverse gear, if you want.

Get our catalogue now, and study up on what the ownership of a Universal means to you. The prices have been revised downward this year.

Universal Motor Co., Oshkosh, Wis.

Not connected with any other firm using the name "Universal"

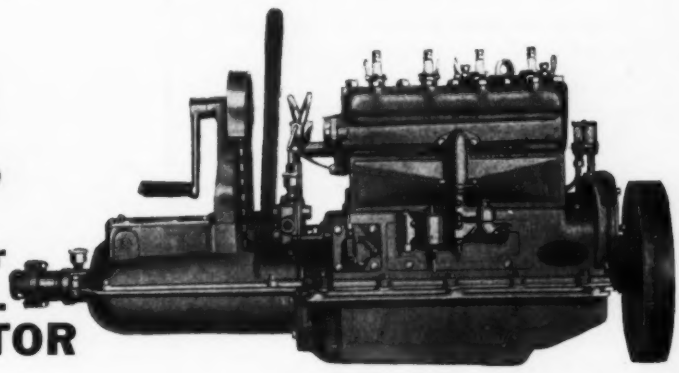
Also manufacturers of Universal 4-KW, and Unimote 2-KW electric generating plants

Universal

4 Cylinder

9-12 H. P.

MARINE MOTOR



The Cruise *of the* Hippocampus

by

ALFRED F. LOOMIS

Now published Complete in Book Form

"THE Cruise of the Hippocampus" which originally appeared serially in MoToR BoatinG has now been published in book form by one of the country's leading book publishers. Unquestionably one of the finest cruise stories ever told, this book was written by a typical boat lover for typical boat lovers.

Perhaps it was Mr. Loomis' ability to visualize his audience through long acquaintance with the readers of MoToR BoatinG that enabled him to talk so intimately of the boating joys and boating trials he met with on this cruise. Starting from New York with two companions in a 28-ft. auxiliary yawl the author experienced about every variety of excitement and adventure there is to be found on a cruise of three or four thousand miles. The trip covered many points of interest down the Atlantic Coast, through the West Indies and across the Caribbean Sea to the Panama Canal.

You'll enjoy this book as proof of the possibilities of small boat cruising, and you'll enjoy it again just as a mighty good story. It presents the rare combination of an actual trip recorded by an interesting writer. There is no need to draw on the writer's imagination when typing his manuscript in the yawl's cabin in some distant port.

Alfred F. Loomis is a writer of real ability, with wide observation and long experience in the operation of small boats. As an officer on a U. S. sub chaser during the war he absorbed the traditions and atmosphere, which makes his writings an authentic picture of life on the sea.

Price $2.00

MoToR Boating 119 West 40th Street, New York, N.Y.

Priscilla, a High Speed Monoplane

(*Continued from page 32*)

and after end. The forward end is to be neatly rounded off about ¼ inch ahead of the coaming. Suitable quadrants and lifting handles of polished brass are to be fitted.

Fender: This is to be of 1¼-inch mahogany or oak half round molding. It is to be screw fastened with holes wood-plugged and tapered slightly at the stem and stern.

Finish & Painting: The entire hull is to be thoroughly dressed and sanded. The bottom seams and the chine seams on the side are to be caulked as already specified. It is to have a coat of hot oil consisting of 2/3 boiled linseed and 1/3 turpentine applied boiling hot. It should be applied on both the inside and outside of the hull below the waterline. The bottom seams are to be filled with a composition made by mixing dry lead and spar varnish to the consistency of putty. The bottom should then receive a coat of lead paint up to the waterline. The sides and decking as well as all natural finish is to be well sanded and cleaned and to be filled with a mahogany paste filler excepting the white pine deck strips. It is then to have a coat of Valspar or the equivalent. This should be well sanded and followed by three additional coats of spar varnish. Apply one coat of varnish to the pine decking before filling the covering boards etc. The interior of the hull is to have one heavy coat of lead paint up to the first batten above the chine. The balance is to have two coats of a suitable color except where exposed where it shall have three coats. The bottom is to have three coats of Valspar bronze. The flooring is to be either finished naturally with three coats of varnish or two coats of paint. All coats are to be well prepared before the succeeding coat is applied.

Fastenings: All fastenings to be either bronze, copper, or galvanized iron. If galvanized iron is used it should be painted with red lead and the holes wood plugged. All screw fastenings are to be at least three times the length of the thickness of the material which is being fastened.

Hardware & Fittings: Steerer will be of the regulation drum type with a 16-inch wheel. It is to have ¼-inch bronze cables extending to the tiller through 3-inch sheaves. There will be a ⅞-inch board extending from side to side in alignment with the center of the sliding tiller to which the sheaves are bolted.

Rudder will be of manganese bronze extending through a bronze stuffing box bolted to the keel. It is to have a hangar support with a special sliding type tiller to be pinned to the rudder stock with a washer on top of the hanger.

The shaft log will be of either the Mechanical Devices Company and Hacker types suited for a 1¼-inch shaft and to be of bronze. It is to be securely fastened with bronze bolts.

Tank will be of the seamless steel bolster type, 14 by 14 by 34 inches. It is to be well chocked into place and clamped with 3/32 by 1¼-inch straps with an ear on same and clamp bolted.

Stem is to have either a special brass shaped cutwater or a ½-inch half round brass molding. This should extend at least two feet under the stem and be screw fastened. Stern will be brass bound with 3/32-inch brass approximately 1½ inches wire. This is to be let into the planking and securely screw fastened every two inches and laid on heavy paint or marine glue.

Deck fittings: There will be one special bow fitting, one combination bitt and flag pole socket, and one special clam shell ventilator. Three special side ventilators on each side and one cabin type ventilator over the watertight bulkhead. There will be two 6-inch cleats on each side, one 8-inch cleat on the after deck, two 5-inch chocks on the after deck, one 4-inch deck plate, over the gas tank, and one after flag pole socket, regulation or combination. This is all to be of polished bronze and fastened with bronze bolts and screws.

Motor & Installation: This design is suited to any light weight motor whose weight does not exceed 900 pounds. The shaft must be driven through a reduction gear and the stringers must be so spaced that the overall width will fit between them. The motor should be connected to the reduction gear through a flexible coupling if the gear is of the beveled type. If not a stub shaft and universal joint should be used. Propeller shaft should be connected directly to the gear which shall be aligned to suit. The gear is to be well secured on the bed. If a ratio of 1¼ to 1 or more is used then 1⅛-inch shafting will be suitable. The motor is to be properly aligned and bolted to a 2-inch engine bed. The exhaust, if through the stern should be through copper tubing. Stacks may be used on this job if desired. All gasoline connections to be of the S.A.E. type with a ¼-inch air line to the tank and a ⅜-inch supply to the carbureter. There will be a shut-off valve at the tank and another at the carbureter. There will be a bronze water scoop or regulation type water fitting with a valve and also a swing type check valve, followed by a stand pipe. Connect this to a

(*Continued on page* 108)

Advertising Index will be found on page 110

Scripps

"The Motor that Crossed the Atlantic"

BUILT IN 2-4 AND 6 CYLINDER MEDIUM AND HIGH SPEED

D2	10-12 HP 15-18 HP	$650
E4	30-45 HP 45-70 HP	$1250
E6	40-60 HP 65-100 HP	$1750

Electric Starter Included

How the Slump was Knocked Cold

In the face of the severe business depression recently passed, SCRIPPS 1922 engine sales surpassed all previous yearly records both in number and volume—even exceeding the boom following the Armistice.

This practical endorsement of the growing popularity of the SCRIPPS is but the natural reward for seventeen years of earnest endeavor and up-to-date engineering, honest material, honest craftsmanship, honest prices and honest service.

Note the compact rugged construction—the accessibility—the convenient arrangement of all equipment—the large, correctly balanced crankshaft, the automatic pressure lubrication to all bearings, even to reverse gear, (no grease cups)—two unit starting and lighting—the double ignition for speed and safety and the exclusive SCRIPPS hot spot manifold that insures perfect carburetion, power, economy and freedom from crankcase dilution.

These are but a few of the features that help make SCRIPPS the mechanically perfect motors.

Learn how little it will cost to enjoy the very best. A full line 10 to 125 horsepower—suitable for almost every type of boat from 18 ft. upward.

Immediate delivery for the Florida season.

SCRIPPS MOTOR COMPANY

5819 LINCOLN AVE., DETROIT, MICHIGAN

A Properly Balanced Propeller

will aid in reducing the annoying and destructive

Vibration

in your motor boat.

There is no excuse for lack of balance in crank-shaft, flywheel, clutch or propeller.

The NWA Balancing Machine offers a means of perfect balance.

Write for booklet "Eliminating Vibrations"

WE SOLVE VIBRATION PROBLEMS

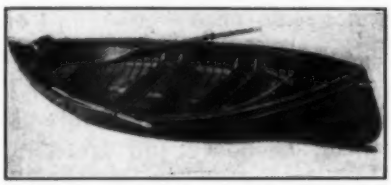
VIBRATION SPECIALTY COMPANY

N. W. Akimoff, Pres.

Harrison Bldg., Philadelphia, Pa.

SKANEATELES BOAT and CANOE CO.

Established 1893



Boats that will last!

For Rowing, Sailing and Outboard Motor

Write for our catalog

38 Jordan St. Skaneateles, N. Y.

Questions and Answers Lesson No. 8

(Continued from page 51)

62. Q: C1 A: *Can buoy No. 1.*
63. Q: N2 A: *Nun buoy No. 2.*
64. Q S15 *A. Spar buoy No.* 15.

What is the method of indicating on the chart the following qualities of the bottom:

65. Q mud *A. "M".*
66. Q specks *A "Sp".*
67. Q shells *A "Sh".*
68. Q pebbles *A: "P".*
69. Q: gravel *A: "G".*
70. Q: sand A: *"S".*
71. Q: How do you determine the scale of a chart?
71. A: *By reference to the note and the scale on the chart.*
72. Q: If one wished to know the direction and force of the prevailing winds east of Bermuda which chart would give one this information?
72. A: *Pilot chart of the North Atlantic Ocean, published by the Hydrographic office, Navy Department, Washington, D. C.*
73. Q: What charts (give numbers) would be required in sailing from Boston, Mass., to New Rochelle, New York? (This question may be omitted if no catalog of Coast & Geodetic Survey Charts is available.)
73. A: *Coast and Geodectic Survey charts Nos.* 246, 109 1208, 249, 113, 1211, 1212, 1213, 272.
74. Q: What charts would be required in sailing from Sault Sainte Marie, Michigan, to Chicago, Ill.? (This question may be omitted if no catalog of charts published by the U. S. Lake Survey is available.)
74. A: *Lake Charts Nos.* 62, 61, 60, 70, 7, 79, 7, 72, 73, 74, 75, 6.
75. Q: What branch of the Canadian Government publishes charts including Great Lakes Lake of the Woods and Lake Winnipeg?
75. A: *Depatrmnt of Naval Service, Hydrographic Survey, Ottawa, Ontario.*

Yard and Shop

(Continued from page 102)

Racing Dates Fixed

What will probably be the beginning of the 1923 racing season will take place at the mid-winter races of the Southern Yacht Club at New Orleans on February 7, 9, 10 and 11. These dates coincide with the annual Carnival and Mardi Gras festival at New Orleans and will form one of the attractive features of this week's festivities. The indications at the present time point to a very successful regatta and will do much to stimulate boating in this section of the country.

Elto Works Growing Fast

Since the return of Ole Evinrude to the outboard motor industry, his new light twin motor has been accorded a vigorous welcome. His new company in a short time since the introduction of the motor has prospered and expanded to an exceptional degree. The introduction of the Elto light twin has been followed by the manufacture of both single and double cylinder light weight machines by other manufacturers. The lead taken by the Elto Company is acknowledged to be in the right direction and the day of the heavy weight motor will soon be over. In the two years since the return of Ole Evinrude to outboard motordom, his light weight machine has proven comfortably portable, light in weight, yet strong and powerful. The weight of the Elto is less than 50 pounds and it is a proven fact that a light weight motor can be built with the same sturdiness as the heavier types. The combination of material and the unusual design has permitted this.

* * *

The Buffalo Book

"The Buffalo Book" is one of the handsomest marine engine catalogs we have yet seen. This book contains complete information about all the Buffalo engines in sizes from 3 to 150 h. p. for powering boats of all kinds. The Buffalo Gasoline Motor Company will be glad to send any boat owner a copy of this book

Priscilla, a High Speed Monoplane

(Continued from page 106)

pump with a hose which should be well clamped. The overflow to be made up with the proper connections and hose and a special overflow fitting. All wiring is to be done in accordance to instructions furnished by the manufacturer and in a first class manner.

General: Any further information on construction or concerning special fittings mentioned may be secured from the designer or from the Editor of MoTor BoatinG.

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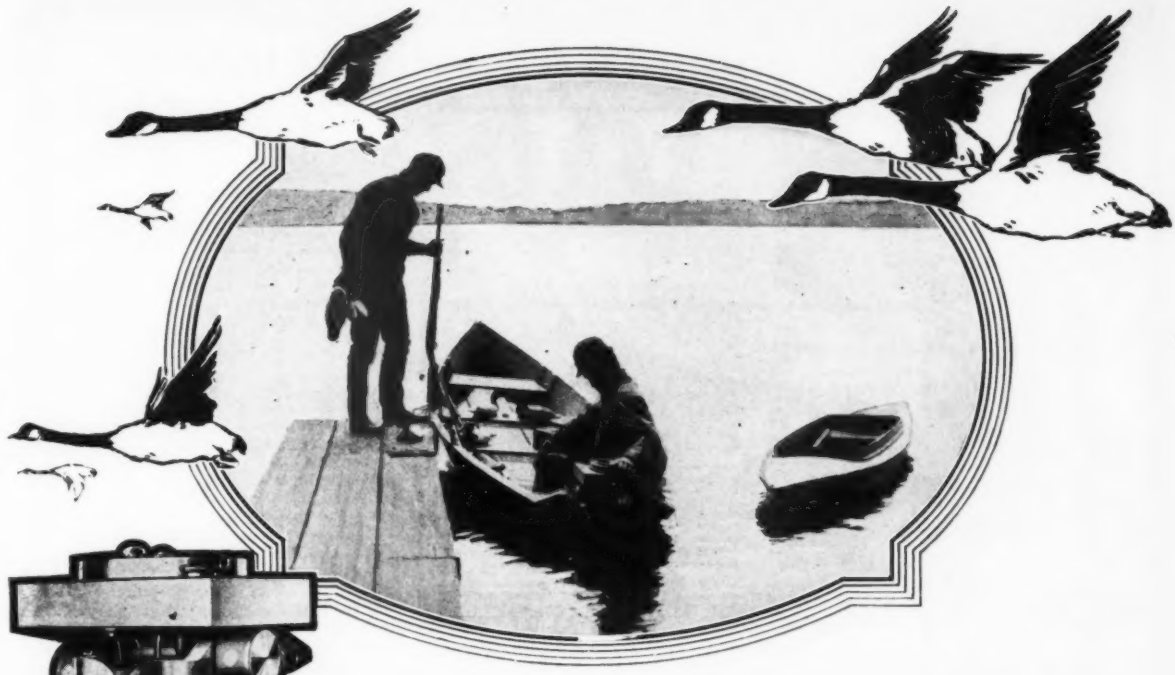

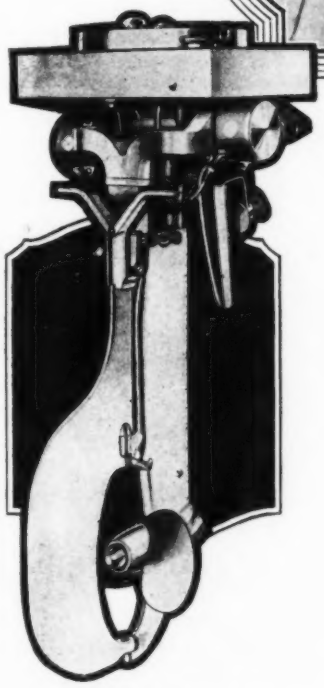

3 H. P. Designed by
Ole Evinrude

ANOTHER VICTORY

Elto takes first place by a wide margin in motor race at Pacific International Regatta on July 29th, against twenty competitors.

Instant Starting on Cold Damp Mornings

You don't have to fuss and cuss and waste time in starting your motor to get to the hunting grounds, if it's an Elto Light Twin.
The Elto Light Twin is the motor with the BIG SPARK. Its ignition embodies the famous Atwater Kent Uni-Sparker. The Elto starts without spinning the flywheel. Simply back the flywheel against the compression point and you get a big, hot spark that gives you a full-power explosion and quickly speeds you away.

Elto's Speed Gets You There First!

You'll make a quicker get-away from the lodge and faster time on the way if your outboard motor is an Elto Light Twin. You can start behind the rest and still get there first to choose your favorite blind
The Elto, Ole Evinrude's latest motor, has proved unquestionably that it's the fastest standard outboard motor. Its full 3 horse-power is equal to the demands of rough, stormy weather.

Safe in Snaggiest, Weediest Shallows.

Sportsmen appreciate Elto's built-in, perfected tilting feature. The Elto tilts automatically over logs and rocks and can be raised entirely out of the water—takes you safely and surely wherever the boat will float. Weedless in construction.
The Elto's light weight, perfect mechanical balance and smooth, vibrationless operation make it safe on the lightest frailest skiffs. Novel underwater exhaust makes it exceptionally quiet. Rudder folds compactly for carrying. Motor is as light as good engineering will permit—48 lbs. The Elto steers from any part of the boat. It's the ideal motor for the sportsman.
Remember its name—The Elto Light Twin. It's the motor that sportsmen everywhere are talking about. For catalog and name of the Elto dealer near you write to

ELTO OUTBOARD MOTOR CO.
Dept. F., Mfrs. Home Bldg. Milwaukee, Wis.

Elto

Light Twin Outboard Motor

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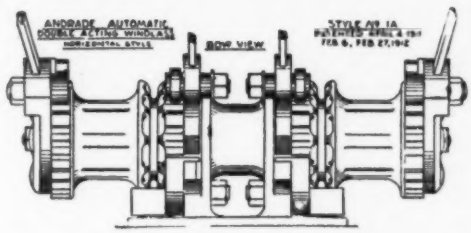
TRADE MARK



ANDRADE AUTOMATIC WINDLASS

Now One of the 1,001 WC Products

WITH an Andrade Automatic Windlass, you can heave in on the chain, let it run free, or stop it at any point—all by means of one lever—without changing the position of your hand on the lever. Heads work independently. The windlass is simple in construction—nothing to get out of order, and very strongly made. Horizontal or Vertical, Single or Double Acting, for Rope or Chain or for Rope and Chain from ¼" to ½". Write for circular giving detailed description.

Ask Your Dealer for WC Dependable Fittings

Long years of experience have taught us to produce goods that can be relied on in zephyr or gale.

Get This Book of Helpful Hints for Motor Boaters

"Sea Craft Suggestions and Supplies" solves those daily "puzzlers" that few know how to handle. Tells how to Box the Compass; what is Proper Ground Tackle; gives hints on Steering Gear, etc.; describes WC Dependable Marine Hardware, tells uses. Compiled from 75 years' experience in making marine fittings. Sent prepaid for 50c.

Wilcox, Crittenden & Co., Inc.

Established 1847

4 South Main St., Middletown, Conn., U. S. A.

THERE ARE

KICKS AND KICKS!!

"FAITHFUL ARE THE 'WOUNDS' OF A FRIEND".

Extract from a letter written by Mr. Thos. P. Hammer, 460 Drexel Bldg., Philadelphia, Pa., dated September 10th, 1922.

"I am owner of a 36 x 10 motor cruiser and am continually nagged by kind friends (yachtsmen and near-yachtsmen)—until I feel that I have missed most of the joys of motor yachting—and all because of the motor! Never have I had the intense joy of a broken piston ring, a warped camshaft or a cracked cylinder, never have I had the exquisite pleasure of cranking a balky motor. To my loss, the engine usually starts on the spark—the magneto furnishes a shocking amount of juice—why, I don't even know how it looks inside. I've never had the good luck to learn how to readjust the timer—never had the pleasure of buying more grease for the reverse chamber—and yet during the past summer I have cruised four hundred motor hours!

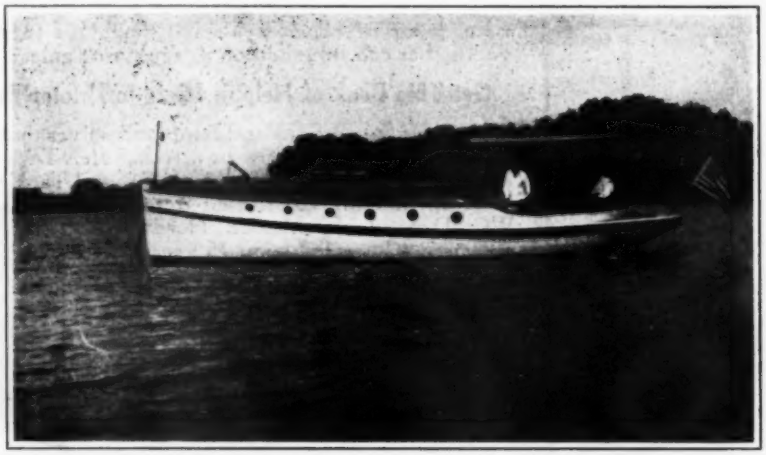
Tell me, why won't the motor balk or miss when pitching and rolling in a sea that makes even the menhaden seiners run for cover—why from dawn to dawn does it sing its monotonous song of perfect chug-a-chug-chug! It surely isn't the environment. I've cruised the Upper Chesapeake, plunged through the fast tide rips in the Delaware—slammed out to sea in a thirty-knot southern and wriggled my way through the grassy flats of Barnegat—and still that darn engine is as remote as the day it was bolted to its bed.

Shall I take it out and junk it and put in some other machine which *will* miss and balk and backfire and break down now and then or shall I leave the present motor in, hoping that some time before I go west, it may act like the motors my friends brag about!—Out of your great experience, Oh, Company of Fay and Bowen, tell me what to do—for it is one of *your own engines*."

'JEAN'
36' x 10' RAISED DECK CRUISER

Owner—T. P. HAMMER
Phila. Pa.

Power—35-HP Fay & Bowen Engine



RELIABILITY F&B

FAY & BOWEN ENGINE COMPANY

104 LAKE STREET, GENEVA, N. Y., U. S. A.

NEW YORK: 44 Third Ave., at 10th Street, Sutter Bros., Representatives
PHILADELPHIA: 116 Walnut St., Marine Equipment & Supply Co., Representatives
BOSTON: 84 Atlantic Ave., Gray-Aldrich Co., Representatives

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